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New Scales for Maternal Narratives and Investigation on Child Development

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New Scales for Maternal Narratives and Investigation on Child Development

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PhD Thesis, 2012

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Abstract

This doctoral thesis aims to extend narrative research by developing an original method for the study of maternal speech. More specifically, the aim is to design and test a new narrative measure, assessing the way mothers formulate and structure descriptions of their children, which is valid, accessible and quick to both administer and code, whilst potentially adding an extra dimension to the information captured by existing coding procedures.

This objective was achieved by developing and validating a new coding scheme to assess structural features of maternal narratives and investigating whether these new maternal scales were associated with mothers' characteristics, children's emotional and behavioural problems and cognitive development. Research was carried out using data from the Environmental-Risk Longitudinal Twin Study (E-Risk Study), a nationally representative cohort of 1,116 families with twins. Maternal narratives were prospectively collected at ages 5 and 10, whilst reports on mothers' and children's characteristics were collected from multiple informants on follow-up visits when the children were aged 5, 7, 10 and 12 years.

Findings showed that two of the four new scales validly measured maternal narratives' structural features. Importantly, these new scales were associated with mothers' personality features, children's externalising and internalising behaviour and children's cognitive development. These associations remained when controlling for socio-demographic cofounders, parenting behaviour and the children's own previous history of behavioural problems and intellectual ability. This research project, therefore, makes an original contribution to research methods that could be readily transferred to clinical practice by developing and testing an innovative and valid measure of maternal narratives' structural features from existing narratives, adding further depth and texture to the existing coding procedures and extending the scope and utility of narrative research.

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Declaration

The research described in this thesis was undertaken using data collected as a part of the Environmental Risk (E-Risk) Longitudinal Twin Study. The E-Risk Study is funded by the Medical Research Council (MRC; G9806489).

Data collection and dataset construction for the E-Risk dataset was completed by the E- Risk Study team. As part of this research team, I interviewed 148 families during home visits when the children were aged 10. I was personally responsible for conceptualizing this study, generating all hypotheses and research questions addressed in this thesis, designing the coding procedure for the new maternal scales, conducting the two pilot studies, carrying out the codification for 1,050 maternal narratives and training a second rater to test the inter-rater reliability of the new maternal scales. I derived all variables, conducted all statistical analyses and wrote all of the chapters. The work presented in this thesis is original and my work, with exception to what has been acknowledged within the text. This thesis has not been submitted for any other degree at any other university.

Chapter 1: Introducing Maternal Narrative Measures

Over the past decades, researchers have systematically investigated the impact of familial environment on children's development and patients' relapse (Brown & Rutter, 1966; Richman, Stevenson, & Graham, 1982). Several risk factors have been consistently associated with an increased probability of negative outcomes in childhood and lower quality of life in adulthood. Among these, the most extensively studied risk factors are: socio-economic disadvantage, low parent education, parental mental health problems and quality of parent-child interactions, including children's experience of neglect and exposure to interpersonal violence (Cicchetti & Toth, 1995; Goodman, & Gotlib, 1999; Rutter, Kreppner, & O'Connor, 2001; Shonkoff & Phillips, 2000; Tennant, 1988). Researchers have continued to investigate these associations to gain an increasingly refined understanding of how these different factors relate, as they may be as much the effects as the causes of children's behaviour problems. Consequently, there has been a growing amount of evidence supporting the possibility that family characteristics predict later risk of adjustment problems (Patterson, 2002; Stormshak, Bierman, McMahon, & Lengua, 2000). Among the most significant environmental influences, family adjustment and parenting behaviour in early childhood have been consistently associated with behaviour problems in preschool children and higher risk for adjustment problems in later childhood (Campbell, 1994; Heller, Baker, Henker, & Hinshaw, 1996; Richman, Stevenson & Graham, 1982).

Parenting behaviour is often defined as a series of attitudes made up of parents' standard practices and responses to their children's behaviours, which are continuously communicated to their children, and that together define the emotional environment in which these familial relationships evolve (Coplan, Hastings, Lagace-Seguin, & Moulton, 2002). The parenting behaviour showing the strongest associations with children's outcomes is related to parents' responsiveness (i.e. parental

warmth, emotional expression and positive reinforcement) and demandingness (i.e. disciplinary practices, control and level of demands and expectations, Bugental & Grusec, 2006).

Parenting has been particularly known to predict children's behavioural, cognitive and social outcomes (Lambourn, Mounts, Steinberg, & Dornbusch, 1991). Findings suggest that early-life experiences exert a powerful impact on later cognitive, social and emotional competencies. These abilities seemed to be interdependent, as children who manifest behavioural problems tend to demonstrate increased academic difficulties, social incompetence and lower self-esteem (Kupersmidt & Coie, 1990). Advances in neuroscience have recently indicated the extent to which early experiences affect the development of neural circuits that mediate cognitive, emotional and social capacities (Shonkoff, 2010; Shonkoff & Phillips, 2000). Findings suggest that these abilities are formed in a predictable sequence of sensitive periods, during which the development of specific neural circuits and structures (and the behaviours they mediate) are most responsive and optimally receptive to environmental influences, good or bad (Fox, Levitt, & Nelson, 2010; Meaney, 2010). Different lines of research have identified that the familial environment in which a young child develops is an important source of stable and growth-promoting relationships, as well as a critical buffer against significant threats to healthy development (Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2007). Nevertheless, the existing gap between what scientists know and what families do to promote the healthy development of young children is still a challenge for both researchers and practitioners. New research exploring the way primary caregivers process, organize and relay information about their children could be a good starting point to inspire fresh thinking about innovative practices that could potentially contribute to narrow this gap.

1.1 The Value of Maternal Narratives

Decades of research in child development have indicated that mothers play a central role in providing the supportive relationships and positive learning experiences that young children need for

healthy development (Belsky, Rovine, & Taylor, 1984; Cohn, Campbell, Matias, & Hopkins, 1990; Cohn & Tronick, 1989; Stern, 1985). This may be due to the fact that mothers often have an important influence on how young children learn to interpret situations and use appropriate strategies to regulate their emotions (Crockenberg & Leerkes, 2005). Since emotion regulation is known to be a key milestone for social and emotional development in early-life, mother-infant interactions may be the primary context in which emotion regulation emerges, and the quality of these formative relationships may be crucial in the development of children's autonomy and mastery, as well as the onset of emotion-related behaviour problems. Previous research has suggested that mothers' support and guidance are even more crucial when children display difficult or disruptive behaviour (Bradley & Brisby, 1993). This is because vulnerable children are at greater risk of having their lifelong learning ability as well as both physical and mental health undermined without this protective support. Understanding the familial environment and, in particular, which features of the mother-child relationship are associated with the onset and developmental course of behaviour disorders is thus crucial to help mothers support their children's optimal development. In examining such factors, a number of studies have strongly suggested that maternal narratives measures are a useful tool to assess the quality of mother-child interactions and the emotional environment at home associated with children's behaviour problems (Daley, Sonuga-Barke, & Thompson, 2003; Hastings & Lloyd, 2007; McCarty & Weisz, 2002; Peris & Baker, 2000; Scott & Campbell, 2000).

This introductory chapter summarises the relevant literature on maternal narratives that led me to pursue this line of research. Firstly, I will describe the most widely researched narrative measures and examine their aims, methods, findings and limitations, focusing on the key measures of Expressed Emotion and Adult Attachment research. Secondly, I will then briefly examine other less commonly researched, but nevertheless relevant, measures. It was based on this theoretical background that I developed the new maternal scales. This chapter will thus set the scene for the

remainder of the thesis, which seeks to investigate the possibility that the richness of mothers' descriptions of their children are not being fully explored, by developing and testing a new measure for structural features, building on pre-existing research in the field.

1.2 Expressed Emotion Research

Amid the narrative measures, the most commonly used is the Expressed Emotion coding system (EE: Brown & Rutter, 1966). EE first emerged in the context of adult psychiatry research, where it was found to predict increased likelihood of relapse and prognosis of schizophrenia at 9 month and 1 year follow-ups (Brown, Carstairs, & Topping, 1962). It aims to assess the quality of familial relationships and, for this reason, is usually measured in key family members, such as the parent or spouse, of the person receiving psychological or psychiatric service. EE aims to capture a general picture of the household's emotional environment as well as providing a fluctuating marker of the intensity of a relative's emotional response to another individual within the family at a given point in time. EE focuses on the content of familial narratives, taking into account both verbal and vocal elements (i.e. what is said and the tone of voice used). It concentrates on the manner used by an individual to describe the other family member, rather than on specific answers to closed questions. It is based on the assumption that the emotional content of someone's descriptions of a family member reflect the quality of their relationship and interactions in their home environment (Baker, Heller, & Henker, 2000; Bolton et al., 2003; Hastings & Lloyd, 2007; McCarty & Weisz, 2002; Nelson, Hammen, Brennan, & Ullman, 2003; Peris & Baker, 2000). It thus focuses on individual-specific expressed emotions; individual with respect to both the person who is describing and the one being described, rather than enquiring about general family qualities (Sandberg, Rutter, & Jarvi, 2003).

Traditionally, EE has been drawn from the extensive 11 hour Camberwell Family Interview (CFI: Vaughn & Leff, 1976) that examines the 3 month period prior to the patient's hospital admission in an attempt to explore reactions to attitudes of hostility and intrusiveness (Brown & Rutter, 1966). Recent studies, however, have used a less time consuming way of gathering similar information, the Five Minute Speech Sample (FMSS: Magaña et al., 1986). This method requires the relative to speak for 5 minutes without interruption, describing their relationship with and their attitude towards the patient. The instructions given focus on the respondent's attitude to the relative, rather than on personal or dramatic life events experienced by the family members. The FMSS methodology is based on the assumption that the time restriction is likely to evoke core emotions more readily, and that the probes should be non-directive in order to avoid focusing the respondent's speech on the relative's psychopathology.

Extensive research has shown that despite dealing with subtle aspects of feelings, EE was found to have a high-degree of interrater reliability and also to correlate well with the emotions observed by professionals when they closely monitored family interactions (Sandberg, Rutter, & Jarvi, 2003 for a review). The way interviewees described a family member, as measured by EE, was thus found to be predictive of the way in which they interacted with that person.

In addition, the concurrent validity of the FMSS has been established, with high degree of correspondence with ratings derived from the CFI (Leeb et al., 1991; Magaña et al., 1986). Much EE research has relied on findings obtained from the FMSS, as this method of collecting data saves considerable time during both data collection and coding procedure. However, although evidence has shown that the FMSS may be reliably used to assess EE, it tends to be a somewhat less sensitive methodology than the CFI, as FMSS ratings tend to underestimate high-EE scores (Stubbe, Zahner, Goldstein, & Leckman, 1993).

The EE construct is mostly used in a two dimensional way to examine critical remarks and emotional over-involvement. The critical remarks dimension is designed to draw on negative feelings or resentment that may be aimed at the individual, whilst the emotional over involvement dimension taps into behaviours that may be overprotective or self-sacrificing in the extreme (Vaughn, 1989). Other dimensions included in this concept are: warmth, positive comments and hostility. Whereas most studies have examined the prognostic power of EE in the context of adult psychopathology, its applications with regard to childhood behaviour disorders have gathered more interest recently, as described below.

1.2.1 Parental EE and Children's Development

Efforts to examine EE in the context of children's mental health, using adapted versions of the CFI and FMSS (Vaughn, 1989), have specified that high EE is a risk factor for child psychopathology. Within this context, research tends to focus mostly on parents' critical attitudes and/or emotional over-involvement towards a child. An individual is considered to have high EE if a parent scores high in either dimension. EE has been linked to children's specific disorders and also to the broad internalising and externalising dimensions (Vostanis & Nicholls, 1995). Children with anxiety and/or behavioural disorders often have mothers who express more criticism, fewer positive comments and less warmth towards them (Butzlaff & Hooley, 1998; Daley et al., 2003; Hibbs et al., 1991; Hirshfeld, Biederman, Brody, Faraone, & Rosenbaum, 1997; McCarty & Weisz, 2002; Peris & Baker, 2000; Reiss, et al., 1995; Scott & Campbell, 2000; Stubbe et al., 1993; Vostanis, Nicholls, & Harrington, 1994). Additionally, mothers with high EE are three times more likely to have a child with a DSM-III diagnosis of substance abuse, conduct disorder or depressive disorder (Asarnow, Tompson, Hamilton, Goldstein, & Guthrie, 1994; Schwartz, Dorer, Beardslee, Lavori, & Keller, 1990). EE has thus been identified as a useful measure associated with the children's mental health.

It has also been suggested that negative family climate, characterised by high levels of parental criticism and hostility as measured by EE, may independently influence the long-term outcome of children with Attention Deficit Hyperactivity Disorder (ADHD: Marshall, Longwell, Goldstein, & Swanson, 1990) Studies have consistently found that parental EE represents a negative quality in family interaction, which differs from other types of family distress and dysfunction (Rogosch, Cicchetti, & Toth, 2004). High levels of parental criticism and hostility, as measured by EE, were particularly related to children's externalising and internalising behaviour (Butzlaff & Hooley, 1998; Daley et al., 2003; Hibbs, et al., 1991; Hirshfeld, et al., 1997; McCarty & Weisz, 2002; Peris & Baker, 2000; Reiss, et al., 1995; Scott & Campbell, 2000; Stubbe, et al., 1993; Vostanis, Nicholls, & Harrington, 1994). Since EE has been described as a good indicator of parenting behaviour (McCarty, Lau, Valeri, & Weisz, 2004), it is likely that the associations found between EE and children's behavioural problems may be partly explained by differences in parenting styles. Overall, these results suggest that EE may contribute to both the study of child psychopathology and of parent-child relations.

A few studies have also used the FMSS methodology in families with infants (Rogosch et al., 2004; St. Jonn-Seed & Weiss, 2002). Their results suggested that caregivers' expression of positive emotion when describing their 6-month old low birth weight infants, assessed with a revised version of the FMSS, was associated with increased caregiver responsiveness during an observed mother–infant interaction. Furthermore, both positive and negative EE dimensions were associated with the caregiving environment in a study investigating caregivers' descriptions of infants from low-income and varied ethnic and linguistic backgrounds (Kaugars, Moody, Dennis, & Klinnert, 2007).

While EE ratings have shown significant stability over periods of up to 5 years in adult populations (Leeb et al., 1991), few studies have demonstrated the stability of EE with regard to young children. Among these, preliminary findings suggest that it reflects a consistent feature of parental attitude, as

it remained stable for over two years in families with young children (Peris & Baker, 2000). Further evidence derived from mothers of children with ADHD consistently suggests that high EE may be a reflection of mothers' inherent characteristics and not a particular reaction to their children's difficult behaviour. This hypothesis was based on results showing that only less than half of the mothers of children with ADHD studied were rated as having high EE (Daley et al., 2003). These findings are of particular interest considering the fast changing behaviour profiles commonly found in young children over a period of two years and the high levels of challenging behaviour usually found among children with ADHD (Biederman, 2005). These results thus suggest that the EE codes are more likely to assess maternal traits rather than merely provide an indication of a particular mood or circumstance.

1.2.2. EE's Limitations

There are some limitations, however, on the use of EE with regards to young children. Researchers have recommended redefining the whole construct of EE, since the definitions of criticism and emotional over-involvement do not seem appropriate when applied to young children (McCarty & Weisz, 2002). Studies of young children have highlighted problems with the measure of emotional over-involvement both in terms of its uncertain validity and rare occurrence (Sandberg et al., 2003). The utility of the emotional over-involvement ratings in regard to young children in the FMSS has also been questioned, given that it was derived from the CFI which was primarily designed to study adults (Peris & Baker, 2000). Thus, important age-related issues should be considered when investigating the validity of the downward extension of the EE coding procedure for use with caregivers of infants and children (Wamboldt, Connor, Wamboldt, Gavin, & Klinnert, 2000). Researchers have suggested that the use of the emotional over-involvement scale may not be appropriate in studies of young children, since the line demarcating normal parental concern and overbearing intrusiveness is difficult to determine. At the very least, the norms for parental behaviour

change through time and the interpretations of such behaviour should be adjusted accordingly, as being overprotective with a young child has very different emotional implications from being intrusive in the life of an adult (Peris & Baker, 2000). The definitions of emotional over-involvement and self-sacrificing behaviour may therefore need to be adjusted when applying these constructs to the study of young children. However, this refinement alone may not be enough because the assumption that overprotection is a negative influence applied in studies of adult psychopathology may not be equally appropriate for research on children. This is because young children might not be hindered by parental overprotection to the same extent as adults, as this behaviour is more likely to be developmentally appropriate (Peris & Baker, 2000). Furthermore, although the emotional over-involvement dimension was useful for evaluating relationships between parents and their adult schizophrenic children, its validity has not been supported in studies with children and adolescents with behavioural or emotional problems; rather, the positive affect components of emotional over-involvement (i.e., maternal warmth) have been related to the strongest positive outcomes. In contrast to emotional over-involvement, ratings of criticism were associated with more negative outcomes across the developmental spectrum (McCarty & Weisz, 2002; Peris & Baker, 2000; Wamboldt et al., 2000).

In response to these concerns, recent studies using the FMSS with children and adolescents have investigated the differential predictive validity of negative and positive affective dimensions of the EE. Maternal difficulties associated with poverty, increased rates of negative life events and mental health difficulties were related to high criticism and negativity (Aber et al., 2000, for a review). Depressed mothers of toddlers, for example, tended to express more criticism regarding their children as compared to non-depressed mothers (Rogosch et al., 2004). Maternal criticism, in turn, has been associated with parents' negative affects, maternal stress, adjustment difficulties and poorer parent and adolescent problem-solving, poorer emotional attunement and worse family

functioning (Baker et al., 2000; Wamboldt et al., 2000). Previous studies have also shown that the quantity of negative comments and global ratings of negativity, as assessed using an adaptation of the EE coding procedure, may play a causal role in the development of antisocial behaviour in preschool-age children (Caspi et al., 2004), whilst positive remarks have been consistently associated with better parent–child interaction and family functioning (Wamboldt et al., 2000). The positive and negative constructs assessed by the FMSS were related to better and poorer child and family outcomes, respectively. These findings thus indicate that adapted versions of the EE coding procedure combined with the FMSS methodology could be a valuable method for assessing the early caregiving environment.

EE, however, has an additional limitation. It has not yet explored the relationships between not just what is said about the child and the tone of voice used, but also the way in which things are said. EE codes do not extract any structural features of the maternal narratives, such as the clarity and cohesion of speech, the levels of consistency and relevance, the parental ability to reflect on the child's needs and also how comprehensive and realistic these descriptions are. New validated measures of maternal narratives' structural features could provide valuable additional information on the crucial role mothers play in the development of children's behaviour problems.

1.3 Adult Attachment Research

A different line of research based on attachment theory developed valid narrative measures that tap into some of the structural features mentioned above, of which the Adult Attachment Interview is the most commonly used (AAI: George, Kaplan & Main, 1985). The AAI is a semi-structured interview used to prompt adults to describe their own childhood relationship experiences. It aims to assess parenting styles, based on parents' descriptions of their own experience of being parented, rather than on their descriptions of their children. Main and her co-workers (1985) were the first to

systematically investigate the associations between these narratives and parenting styles and have identified that structural differences in adults' narratives are consistently associated with differences in how parents relate to their children.

Assessment of the AAI transcripts focuses on the coherence of the interviewee's descriptions, regardless of whether they reflect the historical truth about an individual's childhood. During the AAI, the interviewee is asked to provide adjectives to characterise specific childhood attachment-related early experiences with parents or caregivers and to support these with specific memories. One indicator of coherence of AAI transcripts is an appropriate and consistent fit between interviewees' general descriptions and their specific experiences of attachment, giving a succinct yet complete description, whilst providing relevant details with clarity and orderliness. The AAI classification, and more specifically the coherence score, was found to be the best predictor of overall adult functioning with regard to other forms of attachment.

Through the meticulous study of adult narratives, Main and colleagues (1985) have established that structural features (i.e. levels of coherence, consistency, orderliness and defensiveness) reflect important differences in the organisation of parents' expectations and perceptions shown to be associated with the way they relate to and parent their children. Therefore, they would be crucial in influencing how caregivers interpret and respond to their children, including their perception, selective attention, affects elicited by the information, anticipation of their children's behaviour and also any defensive processes that could be mobilized in the parents.

AAI's basic classification system assigns interviews to one of four groups: 1) insecure-dismissing, an interview which is brief but incomplete, marked by a lack of fit between memories and evaluations; 2) insecure-preoccupied, an interview which is neither succinct nor complete and contains many irrelevant details, together with much passive speech or high current anger; 3) autonomous-secure, an interview which robustly fulfils all or most of the criteria of coherence; and 4) unresolved, an

interview which suggests an extreme bereavement reaction and/or lapses in monitoring speech concerning the loss or trauma (Main et al., 1985).

The signal feature of the autonomous-secure strategy is coherence and a strong valuing of attachment. Autonomous-secure adults are able to think about and describe their attachment experiences in an honest and realistic way, understand the connection between their past and present experiences, and deeply value attachment (Main et al., 1985). They can sustain a coherent state of mind that can support conflicting emotions and incongruent attitudes and discuss them with clarity and cohesion. This leads to a better fit between the individual's internal and external reality and, consequently, more coherent and consistent narratives. Insecurely attached individuals, however, tend to have distorted and fragmented views of relationships, which operate with partially or severed connections, leading to contradictions and incoherence with limited ability to reflect upon conflicting attitudes and repair distortions (Fonagy et al., 1996; Fonagy, Steele, Steele, Moran, & Higgitt, 1991). The dismissing and preoccupied patterns each represent different forms of insecurity arising out of negative attachment experiences that do not seem to have been integrated into the adult's sense of self. The insecure-dismissing strategy leads to global evaluations of a good and normal childhood that cannot be supported by relevant memories. The insecure-preoccupied strategy leads to global evaluations of a difficult childhood that are accompanied by an overabundance of memories from childhood and adulthood associated with feelings of anger and a sense of resignation to difficulties that cannot be overcome. The unresolved pattern is when an adult shows signs of ongoing grief or disorientation concerning past loss or trauma (Main et al., 1985). Nevertheless, one needs to bear in mind that, as with other individual functions, the ability to repair these distortions and disconnections fluctuates depending on situation and varies between people. This doctoral thesis thus aims to make a useful and original contribution to research methods by developing and testing an innovative and valid measure of mothers' structural features. This new

method could be applied to existing narratives, whilst also exploring whether these fluctuate depending on which child the mother is describing, and mothers' individual characteristics. These original findings could potentially help to extend the scope and utility of narrative research.

1.3.1 AAI and Children's Development

The four attachment patterns described above are considered to be organised relationship strategies, which heavily shape caregivers' parenting behaviour. Researchers have established, based on a separation and reunion experiment, that parenting styles impact on children's externalising and internalising behaviour (Ainsworth, Blehar, Waters, & Wall, 1978). For example, young children of parents classified as autonomous-secure on the AAI were able to express negative feelings and behaviours upon separation from a parent and even more importantly to settle and return to play after reunion with the parent. Attachment insecurity was observed when a child was either avoidant or resistant, remaining inconsolable, upon reunion following a separation.

Furthermore, longitudinal studies have shown that individual differences of attachment patterns have high levels of predictability between generations and across life span, with individuals keeping their attachment classification from infancy to young adulthood, (Hesse, 1999; Main, 1995). According to attachment theory, the expectations and assumptions made overt by parents in their interactions with their children would heavily influence their children's perception of themselves, affecting directly their externalising and internalising behaviour (Main et al., 1985).

Following this line of research, studies have demonstrated that some aspects of parents' perceptions of their infants are moderately stable from pregnancy, through the first months of life (Fava-Vizziello, Antonioli, Cocci, Invernizzi, & Cristante, 1993; Mebert, 1991 cited in Zeanah & Benoit, 1995). Moreover, expectant mothers' disorganization in discourse or disorientation in reasoning when

describing potentially traumatic events have consistently been found to predict infant disorganized attachment (Hesse & Main, 1999 for a review). Maternal narratives measures are thus a valid method to assess mothers' ideas and expectations of their children even before they are born. Furthermore, mothers' ability to construct coherent and consistent narratives may be useful to understand how they may interpret and respond to their infants' characteristics, temperament and behaviour after birth.

1.3.2 AAI's Limitations

The AAI measure, similarly to the EE, aims to assess parenting styles and quality of familial relationships. It has nevertheless some drawbacks, such as not considering the parents' tone of voice in its analysis, which means that a considerable amount of data collected in interviews is left unanalysed and alternative codes could make more use of the data available. A further drawback of the AAI is that both stages of data collection and coding are extremely long and time consuming and the average interview is about an hour and a half long, plus an additional preparation time needed to set up and test the recording equipment. It also takes at least three hours for a very well trained clinician and experienced researcher to code one interview. Additionally, correct administration and scoring of the AAI requires extensive training over the period of 18 months. Finally, it is worth noting that due to the high cost of AAI training and of carrying out the tests, there are limited numbers of professionals trained in AAI. Despite these concerns, the AAI findings have been replicated in several different countries (Van IJzendoorn, 1995). Nevertheless, these limitations still restrict the availability and use of AAI by health services and research institutions alike. Thus, a shorter test that could be carried out with less training expenditure could represent significant resource savings, making narrative measures more widely available as a diagnostic and preventative tool.

1.4 Other Measures of Maternal Narratives' Structural Features

1.4.1 Interview of Maternal Representations during Pregnancy

Longitudinal research has explored how pregnant women structured the content of their descriptions of themselves as mothers and of their unborn infants (Ammaniti et al., 1992). Twenty-three women in the third trimester of pregnancy were examined using the Interview of Maternal Representations during Pregnancy (IRMAG: Ammaniti et al., 1992). This measure is based on 5-point rating scales used to code seven dimensions: 1) *Richness of perception*s - the poverty or richness of perceptions of their infants; 2) *Openness to change* - the flexibility of their representations in accommodating new information about themselves and the infants during the pregnancy; 3) *Intensity of involvement* - the emotional investment made by the mothers when describing both herself as a mother and the infant; 4) *Coherence* - the overall organisation of thoughts and feelings in the mothers' description of themselves and the infant; 5) *Differentiation* - the women's awareness of their own characteristics as opposed to their mothers', partners' and families', and the differentiation between themselves and their infants; 6) *Social dependence* - the dependence of women's representation of themselves and of their infants on social values, judgments and attitudes; and, finally, 7) *Immersion in fantasy* - the extent to which the women's view of themselves as mothers and of their infants are coloured or distorted by fantasies or unrealistic preoccupations (Ammaniti et al., 1992). Results suggested that there are similarities in the structural aspects of mothers' descriptions of themselves and their infants, but there are significant differences in content. Three out of the seven scales, including openness to change, richness of perceptions and coherence, showed the strongest associations between mothers' representations of themselves and their unborn infants.

While the IRMAG examined mothers' descriptions of themselves and their unborn babies during pregnancy, the AAI investigated mothers' descriptions of their childhood attachment relationships. Thus, even though the IRMAG measure focused on different types of narratives to the AAI, some of

the structural features of maternal narratives explored by these two measures seemed to be closely related. For instance, both measures examined mothers' level of coherence, the amount and quality of the information presented in their descriptions, including detailed and consistent examples that supported their affirmations and beliefs, and the degree to which mothers remained open to integrate new life experiences into their view of themselves and others. Different narrative measures, therefore, seem to focus on similar structural features. Furthermore, IRMAG results indicated that, although the content of mothers' descriptions varied according to whom they were describing (i.e. themselves or their unborn infants), their structural ratings remained consistent. This suggests that the way mothers formulate and structure their narratives are more closely related to their own personal characteristics than to the subject they are describing. Nevertheless, findings from different lines of research consistently suggest that maternal narratives' structural features can be a useful and valid method to investigate the role of mothers as primary caregivers, as these could be associated with how they parent their children.

The IRMAG has recently been revised to include women's descriptions of their experience of pregnancy and of becoming mothers. The Interview for Maternal Representations during Pregnancy - Revised Version (IRMAG-R: Ammaniti & Tambelli, 2010) is a semi-structured interview consisting of 41 questions. As with the original measure, narratives are evaluated according to their narrative structure and not their content. It is performed between the 6th and the 8th month of pregnancy, audiotaped and transcribed. The average length of this interview is approximately 45 minutes.

The major change was in the seventh scale, i.e. *Immersion in fantasy,* which was renamed *Predominance of fantasies.* This scale was redefined to measure any emerging fantasies regarding the pregnancy, their future motherhood and the child. It is not only the number of fantasies which is considered in assigning the score, but their influence on mothers' descriptions of themselves as mothers and their infants. A second change made to the original protocol was that the initial seven 5-

point range scales were used to assign a final overall classification, each representing one of three different types of maternal narrative: 1) Integrated/Balanced: coherent narratives, in which the description is rich in episodes, moods and has an intense emotional involvement in an atmosphere of flexibility and openness towards the physical, psychological and emotional transformations the mother is confronting. The child is considered as a separate person with his/her own motives and moods; 2) Restricted/disinvested: narratives marked by strong emotional control, with mechanisms of rationalisation towards the fact of becoming a mother and towards the child. They describe experiences of pregnancy, motherhood and the unborn infant in poor terms, without many references to emotional events and changes. This narrative has an impersonal quality, is often abstract, lacking emotion or specific images; 3) Not integrated/ambivalent: confused narratives characterised by digressions and difficulty in answering questions in a clear and articulate way. The coherence level is poor, and the mother's involvement in her pregnancy, her partner and her family is ambivalent (Ammaniti & Tambelli, 2010). This measure is often used in conjunction with 5 scales based on semantic differentials, each containing 17 pairs of opposite adjectives, which are used to independently assess the content of mothers' narratives (Ammaniti, Tambelli, & Perucchini, 1998; Pajulo, Savonlahti, Sourander, Piha, & Helenius, 2001). The revision in the *Predominance of fantasies* scale to include any maternal fantasy or unrealistic preoccupation (regarding the pregnancy, themselves or their baby) could represent an effort to capture smaller signs of mothers' inability to reflect, comprehend and organise their own (and others') behaviours and emotions. This emotional and cognitive ability of making behaviour meaningful and predictable, defined as reflective functioning, has often been recognised as a relevant marker of mothers' narratives.

1.4.2 Reflective Functioning Scale

Another measure used to investigate mothers' narratives is the reflective functioning scale, which aims to assess maternal reflective ability (Fonagy, Target, Steele, & Steele, 1998). Reflective functioning is the ability to understand and conceptualise about one's own and others' behaviour and emotions in terms of mental states, as a way of making behaviour meaningful and predictable. This scale is applied to specific AAI questions, such as demand and permit questions (Fonagy et al. 1998). Demand questions examine both the quality of the infantile attachment experience and its influence on individual development, whilst permit questions aim to activate an adult's metacognitive ability in a more creative and original manner. This scale, therefore, measures an adult's ability to reflect on memories of childhood relationships with their parents. Reflective functioning evaluation criteria are: awareness of the nature of mental states; explicit effort in extrapolating the mental states underlying a specific behaviour; recognition of developmental changes to mental states; recognition of one's own and interviewer's mental states. Coders are required to notice the presence or the absence of a reflective position in relation to both self and others, in order to assign a score on a scale from -1 (Anti-reflective functioning) to 9 (Elevated reflective functioning), with intermediate scores: 3 (Low reflective functioning), 5 (Ordinary reflective functioning) and 7 (High reflective functioning).

As reflective functioning is a broad concept used to explore how one makes behaviour understandable through the identification of underlying mental states and intentions, parental reflective functioning refers to this ability concerning one's child (Slade, 2005). Rather than focussing on memories of a past relationship in one's early childhood, parental reflective functioning explores parents' capacity to reflect on both their children's experiences and their own experiences as parents. Parents with high reflective functioning are not only able to recognise their children's behaviour as caused by inner states, but also as being influenced by their own mental states. For example, a highly reflective mother can understand her daughter's oppositional behaviour as belying

her feelings of sadness, which could at first seem inconsistent with the behaviour; whereas a parent with low reflective functioning is more likely to interpret their child's aggressive behaviour as an indication of the child's badness. This ability to reflect beyond what is immediately known, being able to recognise underlying mental states and intentions, is the central concern of reflective functioning research.

Studies have suggested that mothers' ability to differentiate their own distress from those of their children is crucial for them to be able to manage the children's feelings effectively, particularly during moments involving strong negative affect within either member of the dyad (Fonagy & Target, 2006; Grienenberg, Kelly, & Slade, 2005). For example, a painful experience (in either the child or the mother) becomes more manageable if mother can recognise painful feelings, or disturbing thoughts, as mental states rather than concrete realities, opening the possibility for modulation and change over time (Fonagy, Gergeley, Jurist, & Target, 2002). This is because the mother's reflective capacity allows her to remain emotionally engaged whilst containing the child's distress, transforming the pain into a more tolerable experience for both of them, which will over time increase the child's ability to master his/her feelings and regulate his/her behaviour. This line of research seems to suggest that mothers and children are active agents in this bidirectional relationship and that based on parents' and children's abilities to reflect on their own behaviour and that of others that they will construct meanings, regulate their own emotions and establish relationships. This doctoral research thus draws on many different theoretical backgrounds that have used maternal narratives as a valuable method to investigate the impact mothers, as primary caregivers, have on children's behavioural, cognitive and social outcomes.

1.4.3 Limitations of the IRMAG, IRMAG-R and Reflective Functioning Scale

Like the protocols described previously, the IRMAG has its shortcomings. Firstly, it has been tested only in small longitudinal samples. Secondly, even though it has been revised to include non-pregnant mothers, it still focuses on their experiences around pregnancy and giving birth. It is therefore neither aimed nor tailored to assess specificities related to mothering older, or adopted, children. Finally, its coding procedure is relatively time consuming, as each interview takes on average 45 minutes. A valid new measure of maternal narratives' structures features which could be quickly and easily applied to existing narratives could represent a useful contribution to research methods.

In relation to reflective functioning, researchers have highlighted the need for further empirical testing of the validity and reliability of the reflective function scale, as there are considerable limitations in interpreting the meaning of a given reflective functioning score (Choi-Kain & Gunderson, 2008). This is because this measure aims to assess a multidimensional ability, including factors such as plausibility, consistency, complexity and originality, but the coding is a one-dimensional score. Thus, two different transcripts coded with the same score may summarise very different narratives. For example, a consistently superficial, clichéd narrative with general understanding of mental states, and another transcript with a highly variable capacity to understand mental states with some moments of antireflectiveness and other moments of marked reflectiveness may both receive a score of 3 (Choi-Kain & Gunderson, 2008). In addition, research using the reflective functioning scale is limited by the time consuming and costly nature of the instrument.

A significant body of research from various theoretical backgrounds and using different measures has, thus, identified that maternal narratives can be a useful and valid method to investigate the importance of mothers and their primary caregiving role on their children's development.

1.4.4 Other related parenting research

Attribution theory

Attribution theory is a line of parenting research which stems from the social cognitive theory and that is concerned with how and why people explain events as they do. The basic assumption is that people interpret behaviour in terms of its causes and that these interpretations play an important role in determining reactions to the observed behaviour. It relies heavily on the fact that people are always trying to make sense of the social world around them (Fiske & Taylor, 1991) and it focuses on the mechanisms used by people to attach meaning to their own or to other people's behaviours.

These attributions, or decisions, about the causes of events can be classified into each of three causal dimensions (Heider, 1958). The first is whether the locus of the cause is internal (e.g. personality traits), or external (e.g. situational or environment). The second is whether the cause is stable or unstable. The third is whether the cause is controllable or uncontrollable. For example, people may use attributions for their success based upon their own effort (e.g. they studied hard to pass their exams) or they may attribute failure to their own lack of effort (e.g. they didn't bother to study for the test). In this example, effort is internal and controllable. Alternatively, people may attribute their success or failure to a cause such as luck, which is external and uncontrollable (Dweck, 1999). Attributions are known to affect motivation, performance and emotions, which in turn may contribute to expectancy of future success or failure (Schunk, 1991). This theoretical background was useful to the work described in this thesis because it aims to investigate how mothers organise the information available to them to formulate short descriptions of their children and test whether these narratives are associated with their children's behaviour and cognitive development.

Parent Development Interview (PDI)

A different line of parenting research derives from the attachment theory and investigates aspects such as maternal sensitivity, coherence, expressed emotion and affective components of maternal speech. Research into parent and child attachment have emphasized that the way parents think about and describe their relationship with a child is crucial to determining how they will parent, in particular, when feeling under pressure (Reder & Duncan, 1999).

The Parent Development Interview (PDI: Aber, Slade, Berger, Bresgi, & Kaplan, 1985; PDI-R: Slade, Aber, Berger, Bresgi, & Kaplan, 2003) is a 45 item semi-structured clinical interview intended to examine parents' representations of their children, themselves as parents, and their relationships with their children. Similarly to the AAI (George, Kaplan & Main, 1985), the PDI is intended to assess internal working models of relationships. Unlike the AAI, in which adults are asked about their past relationships with their parents, the PDI elicits representations regarding a current and ongoing relationship that is still evolving, that of the parent with her or his child. It examines whether the parent is able to talk coherently about positive and negative experiences and feelings about their child and their parenting styles. It has been developed to assess how parents think about their child, their relationship with their child and their role as parents. PDI is based on the assumption that a parent's reflective ability, which refers to a parent's understanding of his or hers thoughts, feeling and intentions, is key to examine the quality of their parenting behaviour and of their relationship with their children.

During the PDI, parents are asked to provide adjectives describing their child and memories supporting those adjectives, to describe positive and negative interactions with their child and other typical parenting situations, and to discuss a variety of emotions typically experienced by parents. The parents are also asked to provide real life examples of charged interpersonal moments: "Describe a time in the last week when you and your child really clicked", and then "a time when you

and your child really didn't click". Such questions provide a direct means to evaluate the parent's understanding of her/his own and her/his child's internal experience at times of heightened affective arousal.

Developed to elicit narratives of a parent's representational model of herself as a parent and of her relationship with a target child, the PDI asks parents for specific memories of interactions with a specific child. Interview questions are organized around several themes, such as experiences of success or frustration with the child, challenges, and separation issues. Parents are asked to describe experiences related to these themes and to discuss their and their child's emotional reactions to a variety of experiences. Following each question, parents are asked, twice, to provide specific details when these are not forthcoming. Each interview takes between one and a half to two hours to administer.

The PDI coding system (Slade et al., 2003) is divided into three sections: (1) Parental affective experiences codes, which aims to assess features of the parent's representations of the affective experience of parenting and include Anger, Neediness, Separation distress, Guilt/Shame, Joy/Pleasure and Competence/Efficacy; (2) Child affective experience codes, which aims to measure the parent's representation of the affective experience of the child and include Anger, Dependence/Independence, Separation Distress and Joy/Pleasure and (3) Quality of representation which examines the overall quality of the representation as manifested in the coherence of the representation of the child and in the richness of perception of parental representations. Mothers' narrations of their representations of relationships elicited by the PDI are often coded for content, narrative style, and affect on a question-by-question basis from videotape (Pianta, O'Connor, Morog, Button, Dimmock, & Marvin, 1995). Most constructs are coded on a nine-point continuum, with very low scores indicating efforts to avoid, deny or downplay emotional experience and very high scores

indicating more disruptive and intense levels of emotion. Some scales are scored on a three-point scale and coherence and richness of perception are scored on a five-point scale.

PDI has been used in research and clinical practice to help measure the impact of maternal reflective functioning upon children's attachment styles, as well as inform and direct therapeutic interventions. Findings have suggested that mothers classified as Autonomous on the AAI scored higher on a Joy-Pleasure/Coherence factor on the PDI. In addition, mothers' representations of affective dimensions of the parent-child relationship have been predicted by positive past mothering experiences and by current daily hassles of parenting (Aber, Belsky, Slade, Crnic, 1999).

Several investigators have adapted the style and focus of the semi-structured interview of the AAI to examine mothers' descriptions of their relationships to their children. These interviews focus on caregiving aspects of the parent-child relationship. These descriptions are often rated globally for linguistic markers of internal experience, similar to those assessed in the AAI, e.g. levels of insight/sensitivity (Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989), narrative style, exhibited affect, modulation of affect, and content (Slade, Belsky, Aber, & Phelps 1999; Zeanah, Benoit, Hirshberg, & Barton, 1993), or the presence or absence of security, rejection, uncertainty, and helplessness (George & Solomon, 1996). Global classifications from these scoring systems are related to child attachment classification (George & Solomon, 1996; Benoit, Parker, & Zeanah, 1997; Zeanah & Benoit, 1995; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994), and AAI classification of mother (George & Solomon, 1996; Slade et al., 1999). All these coding systems were thus developed to assess parenting behaviour based on how parents think about their child, their relationship with their child and their role as parents. Even though at times they examine parent's coherence levels, they do not focus on extracting structural features of mothers' short descriptions of their children as collected by the FMSS method. This doctoral thesis, therefore, aims to make an original contribution to research methods by developing and testing an innovative and valid measure

of maternal narratives' structural features from existing narratives, adding further depth to the existing coding procedures and extending the scope and utility of narrative research.

1.5 Objectives of this Study

The studies described in this chapter, in particular the FMSS methodology derived from EE research and the coding systems focusing on structural features of maternal narratives provided a specific theoretical background from which to develop the new maternal scales. They lay the foundation for my work by demonstrating the way in which coherence, together with mothers' abilities to describe their children in an informative, reflective and open manner, may be related to mothers' characteristics, parenting behaviour and children's emotional, behavioural and cognitive development.

This research was conceived as a result of observations that the most widely used existing narrative measures were not fully summarising the richness and complexities of maternal narratives, as well as being, in many cases, costly, time consuming and difficult to use. My research project aims to develop and test an innovative and efficient measure for extracting the structural features of maternal narratives, which is valid, accessible and quick to both administer and code, whilst adding further depth to the existing coding procedures.

1.6 Stages of this Study

I conducted my study in five separate but complementary stages, which are reflected in the structure of this thesis. The first stage involved developing and testing the feasibility of a new coding scheme, the maternal scales, in measuring structural features of mothers' narratives. Two pilot tests were conducted and, after redefining the coding procedure, 1,050 maternal narratives were coded.

The second stage aimed to establish the validity, reliability and stability of the new maternal scales. When exploring the validity of these new scales, I used well established measures to ascertain the inter-correlations between the new scales and the related variables. These analyses determined whether the maternal scales were truly measuring what they were designed for. The reliability of the new scales was tested by examining the correlations between the maternal scales' scores among different raters. Finally, in order to test stability of the maternal scales, the correlations between the maternal narratives at two different points in time, i.e. when the children were age 5 and 10, were investigated. This analysis aimed to examine whether the maternal scales were capturing temporary and changeable features, or more stable and permanent characteristics of maternal narratives.

The third stage of my study explored the associations between the maternal scales and mothers' characteristics. More specifically, it aimed to test whether mothers' personality features, mental health history, experiences of victimisation and parenting behaviour influenced the way mothers formulated and structured their narratives, as measured by the new scales.

The fourth stage examined the associations between the maternal scales and children's externalising and internalising behaviour problems. I used data on children's antisocial, disruptive and aggressive behaviours together with anxious, depressed and withdrawn behaviours. These were based on mothers' and teachers' reports of children's behaviours. . These associations were then controlled for different measures of parenting behaviour.

In the fifth and final stage of my research, I examined whether the new maternal scales were associated with children's cognitive development and social behaviour. This research examined whether children's intellectual ability, academic performance and capacity for socially appropriate behaviour at home and school were associated with the ways mothers structured their narratives, as measured by the new maternal scales.

Chapter 2: Method

The present research aims to develop and test new scales that assess maternal narratives. This chapter describes the study sample, the maternal narratives, the coding procedure utilized and the nine scales derived to assess these narratives. The maternal scales were divided in two groups. The first group aimed to measure how narratives were constructed and consisted of four structural scales which refer to the structure, consistency, accuracy and level of thoughtfulness of the narratives. The second group consisted of five content scales, designed to measure the material described within the maternal narratives.

2.1 Sample description: The E-Risk Longitudinal Study

This thesis uses data from the Environmental Risk (E-Risk) Longitudinal Twin Study, which investigates how genetic and environmental factors shape children's development. E-risk investigated families from two consecutive birth cohorts (1994 and 1995) in the Twins' Early Development Study (TEDS), a birth register of twins born in England and Wales (Trouton, Spinath, & Plomin, 2002). Of the 15,906 twin pairs born in 1994-1995, 71% joined the TEDS register. The sampling frame for the E-Risk study included only same-sex dizygotic twin pairs (i.e. it did not include opposite-sex dizygotic twin pairs) in order to give a better comparison to monozygotic twin pairs who are necessarily of the same sex, i.e. avoiding confounding twin similarity with brother-sister dissimilarity. The E-Risk study, therefore, began with the 73% of TEDS register families who had same-sex twins. Families were recruited to represent the UK population of families with newborns in the 1990s, based on (a) residential location throughout England and Wales and (b) mother's age (i.e. older mothers having twins via assisted reproduction were under-selected and teen-aged mothers

with twins were over-selected). This sampling was used to (a) replace high-risk families who were selectively lost to the register via non-response and (b) ensure sufficient numbers of children growing up in high-risk environments. Age at first childbearing was used as the risk-stratification variable because data were present for virtually all families in the register, it is relatively free of measurement error, and early childbearing is a known risk factor for children's problem behaviours (Maynard, 1997; Moffitt, & E-Risk Study Team, 2002). The study sought a sample of 1,100 families to allow for attrition in future years of the longitudinal study while retaining statistical power. An initial list of families who had same-sex twins was drawn from the register to target for home visits, with a 10% over-sample to allow for non-participation. Of the 1,203 families from the initial list who were eligible for inclusion, 1,116 (93%) participated in home-visit assessments when the twins were 5 years of age, forming the base sample of the study: 4% of families refused, and 3% were lost to tracing or could not be reached after numerous attempts. Data from mothers were collected via interviews. Evaluations of the children's social, emotional and behavioural functioning were ascertained from maternal reports, experimental tasks, observations and questionnaires completed by teachers. Research workers visited each home for 2.5 to 3 hours, individually when the children were aged 10 and in teams of two at phase 5, 7 and 12. When working in pairs, while one research worker interviewed the mother, the other tested the twins in sequence in a different part of the house. Families were given Marks & Spencer or Kingfisher vouchers for their participation, and children were given colouring books and stickers. All 16 research workers had university degrees in behavioural science, and experience in psychology, anthropology or nursing. Each research worker completed a formal 15-day training programme on the mother interview protocol and the child assessment protocol, to attain certification to a rigorous reliability standard, ensure privacy during the interviews, and establish good rapport and to maximize the openness of the caregivers. Home visits helped to ensure complete data that was uncompromised by parents' reading skills, from families

that represent the full population range of risk circumstances. With parents´ permission, questionnaires were posted to children's teachers, and teachers returned questionnaires for 94% of cohort children. Zygosity was determined when the children were aged 5, using a standard zygosity questionnaire shown to be accurate 95% of the time (Price et al., 2000). Ambiguous cases were zygosity-typed using DNA. The sample includes 54% monozygotic (MZ) and 46% dizygotic (DZ) twin pairs. Sex is evenly distributed within zygosity (49% male). Follow-up home visits were conducted when children were aged 7 years (98% of the E-Risk Study families, N= 2,191), 10 years (96%, N= 2,143) and 12 years (96%, N = 2,143). Follow-up visits followed the same procedures, and research workers were trained in the same way. With parents´ permission, questionnaires were mailed to the children's teachers when children were aged 7 years (93% response rate), 10 years (90%) and 12 years (80%). High participation rates were achieved using several measures. Study families provided details of four persons (e.g. grandparents, aunts) who would be able to provide contact information, and also gave consent to contact their general practitioner (GP). Study members were sent a newsletter twice per year and each twin received a birthday card each year. If newsletters or cards were returned undelivered, tracing procedures were immediately initiated. Home visits also helped to achieve high participation rates. In contrast, only 40% of E-Risk families returned repeated postal questionnaires sent by TEDS. Thus, if not visited, families with high environmental risk may have been lost. Parents gave informed consent at each phase of assessment, and children gave assent for the age 12 interviews. Ethical approval was granted by the Joint South London and Maudsley and the Institute of Psychiatry NHS Ethics Committee for each phase of the study.

2.2 Study subsample

Participants were 525 families randomly selected by the data manager of the E-Risk Study, which constituted 49.1% of the families assessed at phase 10. There was a computer procedure involved in this selection of the participating families in which a random list of families´ identifying numbers

was created using Excel. The decision to work with approximately half of the E-Risk sample was based on the time restraints of this project and the time consuming work involved in coding the maternal narratives. At the time of data collection at age 10, mothers were between 24 and 53 years old, and older mothers were between 31 and 52 years old. This sample included 54.5% MZ and 45.5% DZ twin pairs. Sex of the twins was evenly distributed across zygosity (48.1% males).

2.2.1 Particularities of the sample

The original aim was to assess the main caregivers' descriptions of their children, regardless of the caregiver's gender. However, in reality mothers were the children's primary caregivers in the vast majority of the families interviewed (98.7%) and, consequently, the scope of my research was redefined to include only the analysis of maternal narratives.

All mothers completed the five-minute speech sample interview separately for each twin when the children were aged 5 and 10 years. It was thus possible to compare and contrast the characteristics of the narratives between the twins within each family. In addition, this longitudinal research design makes it possible to (1) assess the temporal stability of the ratings for maternal scales and (2) determine whether the new scales were measuring narrative features that were specific to the mothers or to each individual child.

2.3 Measures and procedures

2.3.1 Speech Samples

Speech samples from mothers describing each twin were collected using procedures adapted from the FMSS (Magaña et al., 1986). The speech samples were gathered from mothers when the

children were aged 5 and later at age 10. The potential effect of practice that may have been carried over from the interview at age 5 was assumed to be minimal, considering the short duration of the task, the five-year interval between interviews and the different prompts used on each occasion.

The procedure used to collect the speech samples followed a standardised protocol. Trained interviewers conducted the FMSS interview by asking caregivers to describe each of their children (“For the next 5 minutes, I would like you to describe [child] to me; what is [child] like?”). For this subsample, almost all interviews were conducted with the mothers (98.7%), the remainder being with the fathers (1.3%). Therefore, this project reports mostly on data gathered from mothers’ speech samples and caution is needed when generalizing the results to fathers or other caregivers. The mothers were encouraged to talk freely with few interruptions for as long as possible. However, if the mother found this difficult, the interviewer could aid the mother with a series of semi-structured probes. At age 5, there were two mandatory probes: (1) "How would you describe [child]'s personality or temperament" and (2) "In what ways would you like [child] to be different". At age 10, there were three semi-structured mandatory probes: (1) “How do you think [child] is developing for his/her age?” (2) “In what ways would you like [child] to be different?” (3) “How do you feel about [child] starting secondary school? How do you think [child] will cope?” If mothers had difficulty with the task, the interviewer could assist them with two other semi-structured probes: (4) “How would you describe his/her personality, say in comparison with other children the same age?” and (5) “How do you feel about [child] when you take him/her out in public, such as shopping or visiting relatives?”.

The FMSS interviews were conducted separately for each twin with approximately 90 minutes between each assessment, during which time mothers completed a questionnaire on one twin’s behaviour and on their own personal history of depression, substance abuse and domestic violence. All interviews were audiotaped with the mother’s consent.

2.3.2 Brief review of existing measures drawn from parental interviews

The Expressed Emotion (EE: Brown & Rutter, 1966) is currently the most extensively studied of narrative scales derived from parents' or carers' description of their children. Research into EE aims to investigate the quality of the family environment and its associations with psychiatric difficulties. EE codes have been shown over the years to have a high-degree of interrater reliability and also to agree well with clinical observations of family interactions (Hooley, 2007; McCarty, Lau, Valeri, & Weisz, 2004; Sandberg, Rutter, & Jarvi, 2003). In summary, EE research has shown that the way in which family members describe another family member is predictive of how they interact with that person.

EE codes focus on what is said (content) and the tone of voice used by parents to measure critical, hostile and/or emotionally over-involved attitudes in the family. High EE has long been studied as a risk factor for worse outcomes among psychiatric patients, including schizophrenia, depression and eating disorders (Hooley & Gotlib, 2000 for review; Wearden, Tarrier, Barrowclough, & Rahill, 2000).

Most studies of adults have used the established Camberwell Family Interview (CFI: Vaughn & Leff, 1976) to measure EE in parents and spouses (Bolton et al., 2003; Hooley & Campbell, 2002). However, most of the children's studies have used the FMSS to extract parental EE (Asarnow, Tompson, Woo, & Cantwell, 2001; Caspi et al., 2004; Tully et al., 2004). One major benefit of using the FMSS is that, although it still requires an extensive training period, it takes five minutes to administer and about 20 minutes to code each speech sample. This represents a substantial time saving in comparison to the CFI which usually takes one to two hours to administer plus two to three hours to code each interview. However, this advantage must be considered against the reported

tendency to under-identify high EE when using speech samples derived from the FMSS rather than the longer narratives derived from the CFI (Hooley & Parker, 2006 for review).

Research examining EE in the context of children's psychopathology has identified high EE (e.g. high hostility and criticism) as a risk factor (Vostanis & Nicholls, 1995). Children suffering from anxiety or behavioural disorders are more likely to have mothers whose narratives express more criticisms, fewer positive comments and less warmth towards them (Butzlaff & Hooley, 1998; Daley et al., 2003; Hastings et al., 2006; Hirshfeld et al., 1997; McCarty & Weisz, 2002; Peris & Baker, 2000; Scott & Campbell, 2000; Stubbe et al., 1993; Vostanis & Nicholls, 1995). Studies of school-aged children and adolescents have also reported that children whose mothers displayed high EE were more prone to have a depression diagnosis (Asarnow et al., 1994) and three times more likely to receive a DSM-III diagnosis of substance abuse, conduct disorder or depressive disorder (Schwartz et al., 1990). Although a vast body of research has reported robust associations between EE codes and children's psychopathology, research has not yet explored the relationships between the structural features of maternal narratives (i.e. the way in which things are said, including the construction, consistency and accuracy of their speech) and their associations to children's psychopathology and development.

There is another line of investigation of maternal narratives, based on attachment theory, which explores the way narratives are constructed and structured. The Adult Attachment Interview (AAI: George et al., 1985) is a well-known coding system that assesses some of the structural features of narratives. However, the AAI investigates different types of narratives from those sought in the EE interviews. The goal of AAI is to assess parenting styles and the coding is based on the parents' descriptions of their own childhood experience of being parented, rather than on descriptions of their children. Mary Main and her colleagues (1985) were the first researchers to establish that variations between AAI narratives reflect important differences in the way people relate to one another and

parent their children. Their findings showed that a good correspondence between memories and evaluations of relationships, a succinct yet complete description, the provision of relevant details together with clarity and orderliness are key indicators of narrative styles and attachment classification. Differences in narrative styles were found to be significantly correlated to caregivers' parenting behaviour and children's externalizing and internalizing behaviour (Ainsworth et al., 1978; Benoit & Parker, 1994; Bernier & Dozier, 2003; Bost et al., 2006; Main, 1995; Reese & Farrant, 2003; Steele, Steele, & Johansson, 2002). For example, mothers whose narratives were more coherent and reflective showed more warmth and supportiveness to their children in a problem-solving task, whilst mothers whose narratives were classified as dismissing were less helpful and supportive with a more distant and controlling parenting style (Adam, Gunnar, & Tanaka, 2004; Bosquet & Egeland, 2001; Crowell & Feldman, 1988). However, AAI has important limitations. First, AAI is time consuming to administer and code. Each interview takes about one and a half hours to administer and at least three hours to code. Second, training is scarce, lengthy and costly, which restricts its use by health authorities and research institutions.

Therefore, this doctoral thesis was conceived as a result of observations that existing measures were not fully addressing the richness and complexities of mothers' short descriptions derived from the FMSS. The main goal was to develop and validate new scales that would describe the way mothers organise and structure their narratives. The present research also aimed to investigate whether these structural features, as summarised by the maternal scales, were associated with mothers' personality characteristics and children's development, including their rates of externalizing and internalising behaviour and their levels of intellectual and social ability. These new scales will, thus, contribute to enhance the complexity of existing measures and expand the scope and usage of narrative research.

2.3.3 Maternal scales

The rationale for creating a new coding scheme and generating the maternal scales was based on elements from the EE research and the AAI classification. The EE research has provided a large body of evidence supporting the reliability of the FMSS method and the validity of the EE ratings. AAI research has made available the specific theoretical background used to develop the new maternal scales, as their findings have suggested that coherence, the amount and quality of the information presented in their descriptions, including detailed and consistent examples that supported their affirmations and beliefs, are all related to parenting styles and children's behaviour problems.

Based on the developments and limitations of previous research, I developed an original set of nine maternal scales aiming to assess how mothers organize their thoughts and relay information to the interviewer when asked to describe their children. The maternal scales were designed to assess how mothers formulate and structure their overall expectations and impressions of their children, based on the assumption that these would influence the way they relate to, interpret and parent their children in their home environment.

The maternal scales were divided into two groups, according to the aspects of the maternal narrative they are capturing: structure or content. The structural scales were designed to evaluate indirectly the mothers' cognitive and thought process capacities, through the assessment of the organization of their narratives. The structural scales were: (1) Coherence, (2) Relevance, (3) Reflectiveness and (4) Openness. The content scales aimed to reflect what was said and the tone of voice used by the mothers. The content scales were: (5) Incongruent affect/Sarcasm, (6) Verbal abuse, (7) Affiliation/Pride, (8) Non-compliance and (9) Punishment.

Table 2.1: Summary of the maternal scales

Scales	Description
Group 1: Structural scales	
I. Coherence	Organisation and construction.
II. Relevance	Consistency, relevance and order.
III. Reflectiveness	Ability to understand and acknowledge how the child's development can be affected by positive and negative circumstances.
IV. Richness of descriptions	Comprehensive, informative and realistic.
Group 2: Content scales	
V. Incongruent affect/Sarcasm	Frequency of inconsistencies between the mother's tone of voice and the content, including sarcastic remarks and inappropriate emotional display.
VI. Verbal abuse	Frequency of verbally abusive, humiliating, deprecating, belittling or offensive words.
VII. Punishment	Frequency of reports of physical punishment as a regular form of discipline.
VIII. Affiliation/Pride	Degree of closeness with the child, including descriptions of the quality of their relationship, satisfaction with the child´s development and the reward they get from their experience of parenting.
IX. Non-compliance	Initially gave consent and agreed to take part, but found it difficult to engage in the interview and did not comply with the instructions.

2.3.4 Coding Scheme

In this section, the content of the scales and the coding will be introduced, giving excerpts from maternal narratives coded to illustrate, further clarify and contrast the scales and the coding procedures. Each narrative received a score for the nine scales.

Group I: Structural scales

The first four maternal scales were coded using a four-point Likert scale (0–3). Higher scores reflect an increased presence of the construct. Four-point scales were chosen to assess the gradient of the measured dimension without a mid-point category. Previous research has shown that the presence of a mid-point category could lead to bias. Worcester and Burns (1975) argued that the use of a scale without a mid-point tended to push more respondents to the positive end of the scale and Spagna (1984) suggested that participants allocated fewer positive responses and more negative responses when a mid-point was added to a scale. Garland (1991), however, showed that using a scale without a mid-point helped to reduce social desirability bias without changing the direction of opinion. In order to minimise any of the biases reported by previous researchers and to reduce social desirability bias, four-point Likert scales were used.

I. Coherence

The Coherence scale aimed to assess the mother's ability to organize and structure her speech when asked to describe her child. The scale was designed to explore the way in which the narrative flows, focusing on any significant disruptions and shifts in the discourse, together with the clarity and cohesion of her speech.

A score of 0 indicated a **very incoherent discourse,** marked with significant shifts. The events described seemed unrelated and the narrative was fragmented. For example, when asked to describe what the child was like in the last six months, one mother said: “She is a boy. She is not really a girl. People think she is a girl, but I know she is a boy”. Another mother replied: “But when he was born, he was really sick. He is doing really well at school. But when he was born, I was worried to death. When his dad lived with us, [the father] was violent. But he used to really like him. He was born with a genetic problem.”

A score of 1 indicated an **incoherent discourse**, where the narratives showed some coherence but there was a clear absence of connections between phrases or disrupted sentences. For example, when asked to describe what the child was like, one mother said: “She has a bad temper. She is just like me when I was a child. Her sister is really placid; she gets on with all my other children. My mum had a bad temper too. When I was a child, I used to be very much like her.”

A score of 2 indicated a **coherent discourse,** where the narratives lacked abrupt shifts. Narratives were clear and orderly but not very cohesive. The following example received a score of 2. When asked how the child would cope with secondary school the mother replied: “She will cope fine with secondary school. But I am very worried about them, because it is such a big step. But she will cope fine.”

A score of 3 was given for **a very coherent discourse,** where narratives were clear and orderly. Each aspect of the mother’s discourse refers to or follows from a theme discussed previously throughout the task. The following example is of a maternal narrative which received a score of 3 for the Coherence scale. When asked to describe her son, a mother said: “He is quite confident and likeable, but is a bit of a showman; likes to be the centre of attention sort of guy and really demands a lot of attention because of it. [Child’s name] would get far more upset about if you are away and

can't be with him at a particular time, he would react more to that, he likes to be the big popular all in one, but if it does not go his own way, he would be far more sulky and he has tantrums almost like a four year old, he can lie on his back and kick his legs if he wants to."

II. Relevance

The Relevance scale aimed to assess the mother's ability to stay focused throughout her speech. It measured whether the narratives were consistent and pertinent to describe the child. It focussed on the relevance of the narratives in response to the probe. Different types of digressions were sought to be captured, including narratives that were considerably evasive, excessively preoccupied and/or narcissistic.

A score of 0 represented **distorted, narcissistic or preoccupied discourses** where the mother´s narratives were completely disconnected to the question asked. There were significant gaps in the descriptions of the children, and the narratives were characterised by an excessive preoccupation with oneself or earlier experiences, (e.g. divorce, bereavement, mother's own mental state, domestic violence). It included narratives where a great deal was said but little was conveyed about the child's personality, behaviour and feelings. When asked to describe what the child was like, one mother said: "(Pause) she has changed, she has like stepped back a bit, she's been like babyish, I don't know why. She's just, she's changed...She has dropped down a bit, don't know why. I do worry about her at school because I think she might be a bit behind at school. I need to go there and find out again. I do worry about her ´cause she has dropped down a bit. She could yeah... she has. She could be up a bit more. I don't know how she got like that. ...She needs to learn quite a lot from now... another class, another year, yeah...because I need to... like... because I am busy as well it is a bit hard for me to phone them up, the school, and time I get home to find out about what's happened

to her until parents' evening. So, yeah, I need to find out more about her and make sure if she is alright."

A score of 1 was given on the Relevance scale for **evasive and dismissive discourses** where narratives lacked significant connection or relevance to the question asked. These narratives were erratic and patchy. There were significant gaps that needed to be filled in and some interpretation by the coder was necessary to understand what they meant. It included narratives where mothers insisted that they "don't know" or used medical jargon repeatedly to describe the child. The following examples were reported by mothers who received a score of 1 on the Relevance scale. When asked to describe their child in the last six months, one mother said: "He has ADHD; that is what he is like ADHD. That is he. I do not need to say anything else; he has ADHD." Another said: "She is [child's name], that is her. She is just [child's name]... (long pause) Don't know... (long pause) She is good girl (long pause) don't know what else...". These narratives may signal the caregiver's disengagement or an emotionally impoverished relationship with the child.

A score of 2 was given for **pertinent discourses with minor inconsistencies** where narratives followed on from, and were compatible with, the probe but had minor inconsistencies or contradictions, such as "slips of tongue". Mothers who received a score of 2 had narratives where their speech moved away from just describing the child in question to include "the twins", "they" or "the children". This score accounted for minor digressions, such as "he is just like his dad" or "just like me". For example, "[child's name] is funny and well-liked at school, all the children really like him. He is helpful around the house. He always helps me with my daughter. If you ask him to find something, he can always find it straight away (laughs) he is really good, on the ball, [child's name] is really helpful. He reminds me of his dad really because he's more like his dad than he is like me in that way".

A score of 3 represented **pertinent and consistent discourses** where narratives followed on from, and were compatible with the probe or question presented. There were no contradictions or digressions. Narratives expressed, in a straightforward manner, a reasonably complete and detailed impression of who the child is. “She is a very likeable and caring child. She offers to help around the house; she hoovers without me prompting; she helps the old lady that lives next door, and does the washing up for her. She also helps around the school when there are new children arriving. She befriends them and helps them settling in. Everybody seems to like her.”

III. Reflectiveness

The Reflectiveness scale measured the mother´s capacity to recognize and foresee the impact on the child’s development of both positive and negative events affecting the family. It assessed the mother’s ability to think about the impact of beneficial and constructive experiences on the child’s personality. Moreover, the Reflectiveness scale focused on the description of any present and/or potential difficulties that the child may face and/or encounter in the near future. It also included reflections on the child’s ability to cope with these issues. The scale is derived from the following mandatory probe: “How do you feel about [child] starting secondary school? How do you think [child] will cope?”

A score of 0 represented **a discourse without any evidence of reflection**. The speech focused on blaming the child alone for all the difficulties faced by the mother and the family. The narratives portrayed only the negative characteristics of the child and the detrimental impact the child has or had on his/her environment. The child was said to be “the problem”. It also included descriptions of the parents’ difficulties in caring for the child. A score of 0 was given for examples such as: “She is a

bitch. My life is hell. Since she was born, it's been a nightmare," or "She is a cow, because she hovers".

A score of 1 indicated a **discourse with a low level of reflection** where the narratives showed limited understanding of the child's development in relation to any present and potential difficulties. The mother expressed a limited understanding of how the child could have been affected by negative and positive experiences and the ways in which he/she coped with any difficulties. The following is an example for a score of 1: when asked how the child would cope with entering secondary school, the mother replied: "He has to go, he will have to cope". It also includes idealised descriptions: "He is such an angel. He will always be..."

A score of 2 represented **a reflective discourse** where narratives indicated some understanding of the child's development in relation to present and future circumstances. The mother may have had some knowledge about the impact of these events on the child's development and the ways in which he/she would cope, but these descriptions were not very comprehensive or detailed. The following example was rated as 2: "He will be okay when he goes to... up to high school. He wants to go. We have talked about it. He will be fine."

A score of 3 was given for **a very reflective discourse** where narratives were thoughtful and sensitive to any past, present or future difficulties that the child may have experienced. The descriptions acknowledged that the child could be affected by positive as well as difficult circumstances, and clearly recognized the child's coping strategies. The following example had a score of 3 on the Reflectiveness scale: "She will find it daunting when she goes to secondary school, because she goes to a very small primary where she knows everybody. She will gradually settle in and make friends (pause) she makes friends easily; she is a bit of an extrovert. She is very good at sports as well, and I think this will help her."

IV. Openness

The Openness scale aimed to assess the accessibility of the information about the child and the mother´s capacity and willingness to share it with the interviewer. It evaluated the comprehensiveness and richness of the descriptions. Finally, it appraised whether the mother´s statements could be supported by comprehensible and fitting examples and did not simply constitute a list of disconnected adjectives.

A score of 0 was given on the Openness scale for **very restrained discourses** where narratives provided very limited information about the child. There was extreme reluctance from the mother to disclose information, accompanied by long pauses. A score of 0 was given to the following examples: "He's good (long pause) very good boy (pause) he's good boy (long pause) I don't know (pause) he's good (long pause) I don't know". There may be use of isolated adjectives to describe the child without any explanations or examples, similar to a shopping list: "She is good (pause) friendly (pause) caring (pause) good girl".

A score of 1 was given for **discourses with strong avoidance** where narratives included some information about the child but were incomplete and limited. The mother may have given a restricted description of the child or was not interested in describing and thinking about the child. Example: "I don't know (pause) he is alright (pause) he is a good (pause) he is alright (pause) this is really difficult (pause) he likes football (pause) he likes it a lot".

A score of 2 represented **discourse with mild reticence** where narratives gave a good idea of who the child is but included some hesitation. There may have been pauses or gaps but the narratives did not demonstrate significant avoidance as described in scores 0 and 1, above. For example, the

following response received a score of 2: “He is really good (pause); he helps around the house (pause), does homework, takes off his uniform when he gets home (pause), he is helpful”.

A score of 3 indicated **very open discourses** where the narrative gave a full and complete picture of the child. It included positive as well as negative aspects of the child and the statements were supported by many examples. The descriptions were succinct yet very informative. The following example has been attributed a score of 3. When asked to describe her child, a mother said: “She is very sensitive, out of the two of them, she is certainly the one more likely to take offence, if you said something to her that... well... she wasn’t very happy about, like something she wasn’t wearing... she would get the oomph and get up in a huff. She is the less confident.”

Group II: Content scales

The second group of maternal scales aimed to explore the content of the maternal descriptions of the children. Instead of characterizing the narratives according to a four-point scale, I opted to count the frequency of the emotional feature expressed for the incongruent affect/sarcasm, verbal abuse and punishment scales, in order to ascertain whether, if at all, these features were present in the maternal narratives and how often these themes would emerge. For the two remaining scales, affiliation/pride and non-compliance, the coding followed a three-point scale (0–2), where higher scores reflected an increased presence of the construct. I decided to have a different rating scale for affiliation/pride and non-compliance because they aimed to investigate the overall intensity of these features, when present in the maternal narratives (0 - No, 1 - Little/some or 2 - Strong presence of the construct).

V. Incongruent affect/Sarcasm

This scale was devised to assess the frequency of instances where the mother's tone of voice did not match the verbal content. The scale was designed to investigate the inappropriateness and irrelevance of the mother's emotional display with regard to the descriptions. This included use of sarcasm and any inappropriate emotional display, such as laughing when describing a child's disruptive, defiant, disobedient, destructive or aggressive behaviour; or saying sweet words in a sarcastic and mocking tone. Examples included: "He has a real bad temper (giggles); when he is angry, he goes to his room, slams the door and chucks everything on the floor. He destroys all his toys...everything that is on his bookshelf. He hardly has anything now (giggles)"; and "She is *a little angel (sarcastic intonation)*".

VI. Verbal abuse

This scale was designed to explore how often the mother used insulting and abusive words to describe her child, indirectly assessing the level of aggression and hostility in the maternal speech. The scale measured the frequency of any strong or insulting language, together with regular words used in a degrading and offensive way to describe the child. Examples of verbal abuse were "twat", "he is a brat" and "she is a cow".

VII. Punishment

This scale was designed to measure how often the mother mentioned carrying out any kind of physical punishment as a common and actually practised form of punishing or disciplining the child in their household. It included description of the use of *physical* force intended to cause some degree

of pain or discomfort in order to discipline, control or change behaviour, even when performed in the belief that it was correctly educating or bringing up the child. This included hitting the child with a hand or other object, pinching/pulling the hair/ears, shaking, kicking, caning or whipping. “She sometimes winds me up so much that the only way I can stop her is by smacking her”.

VIII. Affiliation/Pride

This scale was designed to indicate the level of affiliation/pride expressed by the mothers in their description of their relationship with the child. This scale comprised descriptions of the quality of the relationship, level of maternal satisfaction with the child’s development and pride in the child’s attainments and achievements. It included references to the perceived rewarding and gratifying experiences of parenting.

A score of 0 indicated **no affiliation** where narratives did not express indications of proximity between mother and child nor the mother’s satisfaction with the child’s accomplishments. It included narratives where there was no recognition or mention of the quality of their relationship and also narratives where the mother was not pleased with the child’s development. “She is [child’s name]. That is her. She is [child’s name]”.

A score of 1 showed **little affiliation** where narratives indicated some degree of closeness to the child and gratification with his/her achievements. However, these expressions were sporadic and irregular or only present for part of the interview. An example of this kind of narrative is: “She gets on with everybody in the house, but we do wind each other up quite chronically. We are too alike.”

A score of 2 signalled **strong affiliation** where narratives conveyed a constant awareness of the close connection between mother and child and an all-encompassing appreciation of the child’s

development. It also included the mother's strong recognition of their satisfaction with the quality of their relationship. "He is such a nice boy. He is really helpful. I don't even need to ask for him for help, he comes to me and offers to help with whatever I am doing around the house. He does his bed, hoovers, washes up, does his homework..."

IX. Non-compliance

This scale aimed to identify the participants who had initially given consent and agreed to participate to the interview but, at the time, found it difficult to engage in the task of describing their children and did not comply with the instructions given. Higher scores reflected an increased presence of the construct.

A score of 0 indicated **compliance**, where narratives followed the instructions and prompts given. It included narratives that were informative and described the child well. "She is a tomboy. You will never see her wearing anything pink or sparkly. She is always in combats and trainers. She doesn't own a dress or a skirt. She likes playing football with the boys on the street. She is a good kid. She is popular at school and has lots of friends. Recently there was a new child at school and she befriended her, became her buddy and helped her settle in."

A score of 1 indicated **little/some compliance** where narratives indicated an initial attempt to fulfil the task but, for one reason or another, the mother was not able to sustain this effort throughout the five minutes. For example: "He is a really good boy, but when he was a baby he was very sick. I was worried to death. It was horrible not to know whether he was going to be ok. He was so tiny. I was in hospital for a long time with him and the other one was at home...".

A score of 2 described **non-compliance** where narratives did not answer the probes or comply with the instructions. It included narratives that continuously avoided the task or focused on describing an unrelated or irrelevant subject, for example: “He is just like me. When I was his age, I used to be stubborn and argumentative. I would always want to have things my way...”.

2.3.5 Coding procedure for the maternal scales

I coded a total of 1050 maternal interviews. Throughout the coding, I remained blind to all other variables, including information regarding the mothers’ and children’s mental health, twins’ zygosity and families´ socio-economic background. I first coded the maternal scales for a subsample of 50 interviews, targeting the elder twin before the ratings of the younger co-twins were carried out. This procedure was done for the whole sample and allowed a mean time interval of approximately 2 weeks separating the coding of the maternal narratives for the twins within a pair. This time delay was set in place to prevent the maternal scales ratings of the FMSS for the first twin influencing the coding for the second. The possibility that the coding of the elder twin first could have introduced a bias was investigated when testing the validity of the maternal scales (Chapter 3). After I completed rating 100 to 150 interviews, I entered the data into an SPSS data file and screened for errors by double checking the descriptive statistics for each scale. Please refer to Annex 1 for a copy of the coding sheet.

After describing the coding scheme and procedure, the question that naturally arises is whether these scales are reliable and valid measures of maternal narratives. The following chapter will describe two pilot studies, testing the feasibility and validity of the maternal scales. Please note that the description of the other variables considered in this project will be included directly in the relevant chapters. After establishing tests for the validity of the maternal scales, I will investigate their

association with (1) mothers' characteristics, including their personalities, mental health history, substance abuse, experiences of victimisation and parenting behaviour, (2) children's externalizing and internalizing behaviour problems, together with different measures of parenting, and (3) children's cognitive development, including measures of children's intellectual development and social cognition.

Chapter 3: Psychometric Characteristics of the Maternal Scales

This chapter expands the scope of narrative research by exploring the validity of new scales derived from maternal descriptions of children. First, the rationale for developing additional scales to extract maternal narratives' structural features is described. Second, two pilot studies, which assessed the feasibility of deriving the maternal scales and subsequent required adjustments, are shown. Third, testing of several aspects documenting the reliability and validity of the maternal scales are presented, including: 1) inter-rater reliability; 2) temporal stability; 3) construct validity; 4) analysis of potential biases; and 5) the internal structure of the maternal scales.

3.1 Introduction

This project was initiated in light of observations suggesting that existing maternal scales were not thoroughly exploring the structural complexities of the information available in the maternal narratives. I proposed that maternal narratives contain three distinct features that could be further quantified: 1) content (i.e., what is said by the mother), emotional tone (i.e., how things are said) and the structure of the narrative (i.e., the way mothers construct their narratives). Expressed Emotion (EE: Brown & Rutter, 1966) is the most widely used and empirically tested coding procedure aimed to measure the emotional content of the narratives. The EE coding procedure derived originally from the Camberwell Family Interview (CFI: Brown & Rutter, 1966; Rutter & Brown, 1966). The CFI is a semi-structured interview asking parents or carers to describe their attitudes and feelings towards their relatives. The CFI is time-consuming to administer, generally lasting over three hours, labour intensive to code, and training is difficult to obtain (Hooley & Parker, 2006).

To overcome these shortcomings, an abridged version of the CFI was developed by Vaughn and Leff (1976), which takes just over an hour to administer. Alternatively, Magaña and colleagues

(1986) developed a short semi-structured interview, the FMSS, to measure EE. In comparison to the CFI, the FMSS gathers shorter narratives, making it considerably faster to code (Van Humbeeck et al., 2002 for a review). The concurrent validity and the inter-rater reliability of the FMSS were investigated by comparing ratings derived from CFI and FMSS in a pilot sample of 10 narratives and, later, using 50 narratives from parents of adult schizophrenics (Magaña et al, 1986). Results indicated moderate associations and good inter-rater reliability between the EE ratings extracted using both methods, but a slight tendency to under-identify high EE when using the FMSS (Hooley & Parker, 2006).

The validation of the FMSS procedure encouraged researchers to extend EE research to predict children's psychopathology. Consistent findings have indicated that high levels of criticism and hostility in parental narratives were associated with elevated levels of internalizing and externalizing behaviour problems in children (Asarnow et al., 2001; Butzlaff & Hooley, 1998; Chambless & Steketee, 1999; Daley et al., 2003; Hastings et al., 2006; McCarty & Weisz, 2002; McCarty et al., 2004; Scott & Campbell, 2000; Stubbe et al., 1993; Vostanis et al., 1994). Researchers have identified several limitations when applying the EE coding procedure to children samples. These included concerns regarding the validity of the emotional over-involvement construct in relation to parenting of young children (Daley et al., 2003; McCarty & Weisz, 2002; Wamboldt, O'Connor, Wamboldt, Gavin, & Klinnert, 2000) and empirical evidence suggesting that emotional over-involvement may not relate to parent–child interactions at all (McCarty et al., 2004). Additionally, the EE coding procedure focuses solely on the content of parents' narratives and their tone of voice. The latent structure of the narratives is minimally delineated, including the clarity, cohesion, consistency and relevance of the narratives. Therefore, it is possible that by examining the structure of parental narratives, additional information could be gained about the quality of parent-child relationships and their association with children's externalising and internalising behaviour problems.

Unlike EE coding procedure, the Adult Attachment Interview (AAI: George et al., 1985) allows the representation of some structural features of parental narratives. In contrast to CFI and FMSS,

AAI classifications have a different aim and derive from a different type of narrative. AAI aims to test the extent to which the speaker can sustain a coherent narrative, when describing their own experiences of being parented, whilst valuing these formative relationships and the people involved (Steele & Steele, 2008). Researchers have established the predictive validity of AAI by confirming its associations to the quality of interviewees´ relationships with their children and to different parenting styles (Baradon & Steele, 2008; Bus & Van IJzendoorn, 1992; Crowell & Feldman, 1988; Fonagy, et al., 1991; Grossmann, Fremmer-Bombik, Rudolph, & Grossmann, 1988; Grossmann, Grossmann, Kindler, & Zimmermann, 2008; Main et al., 1985; Main & Goldwyn, 1992; Van IJzendoorn, Kranenburg, Zwart-Woudstra, Van Busschbach, & Lambermon, 1991; Steele et al., 2002; Steele, Hodges, Kaniuk, Steele, Hillman, & Asquith, 2008). AAI findings have been replicated across several different countries (Van IJzendoorn, 1995). The systematic investigation of the psychometric properties of AAI has examined: (a) the reliability of responses over time and across interviewers; (b) the influence of non-attachment-related autobiographical memory; (c) the influence of intelligence; and (d) the effect of social desirability (Bakermans-Kranenburg & Van IJzendoorn, 1993). Results showed that AAI classification was not tainted by interviewer effects, non-attachment-related autobiographical memory, intelligence or social desirability. Additionally, researchers who found modest associations between AAI classifications, IQ scores and social adjustment, did not find a relationship between these factors and social desirability (Crowell, Waters, Treboux, & O'Connor, 1996). Overall, studies suggest that AAI is a valid and reliable measure of attachment style.

AAI, however, has some important limitations. It does not consider the parents' tone of voice, which means that a considerable amount of data collected in interviews is left unanalysed. Furthermore, data collection and coding procedures for AAI are fastidious and lengthy. Each interview takes on average an hour and a half to administer and three hours to code. Accurate administration and scoring of AAI requires extensive training, which restricts its use in clinical practices and for research purposes. There is a need for empirically validated scales that can be

used by minimally trained health professionals or researchers to assess the structural features of maternal narratives.

This study aimed to test the validity of new maternal scales. To achieve this, I conducted two pilot studies and then assessed the reliability, concurrent and discriminant validity of the maternal scales and tested the coding for a series of potential biases. The new coding scheme consisted of 9 scales designed to assess how mothers organise their thoughts and relay information to the interviewer, when asked to describe their children. More specifically, the scales aimed to describe structural and content features of maternal narratives. The Structural Scales are: 1) Coherence; 2) Relevance; 3) Reflectiveness; and 4) Openness. The Content Scales are: 5) Incongruent affect/Sarcasm; 6) Verbal abuse; 7) Affiliation/Pride; 8) Non-compliance; and 9) Punishment and aimed to identify more factual aspects of maternal narratives.

The reliability of the maternal scales was examined by testing inter-rater reliability and temporal stability. Inter-rater reliability is a test of the regularity of the coding procedure, examining the extent to which two or more raters consistently agree on the ratings. Temporal stability was assessed by comparing maternal scales' ratings when children were 5 and 10 years old. While children may change dramatically during that developmental period, I selected this length of time to test the temporal stability of the new scales in order to determine whether they were capturing stable narrative features rather than transient maternal reactions to their children's behaviours.

In order to assess the construct validity of the maternal scales, I first tested whether the scales were measuring narrative features that were specific to the mothers or whether they related to children's characteristics. The hypothesis is that the way mothers think about, organise and relay their ideas about their children may represent particular characteristics of themselves which are not dependent on the children's attributes, such as their personality or behaviours. Additionally, I examined the convergent and discriminant validity of the maternal scales. Convergent validity is the general cohesion between variables, gathered independently of one another, that should be theoretically related (Campbell & Fiske, 1959). Thus, to test for the convergent validity, measures that were expected to be theoretically related to the maternal scales' ratings such as socio-

economic deprivation, mothers' educational levels and cognitive skills were used. First, research shows that adults experiencing severe hardship may experience difficulties carrying out tasks that rely on high level functioning (Lynch, Kaplan, & Shema, 1997). Consequently, one would expect that mothers experiencing severe hardship would have more trouble describing their children and that the level of socio-economic deprivation experienced by the families would be closely related to all maternal scales. Second, mothers' educational level was used to test whether the maternal scales were a direct reflection of the mothers' logical abilities, as highly educated mothers may be more able to detect and avoid logical inconsistencies, producing richer and more coherent narratives. However, measures of mothers' educational level and maternal scales were expected to be weakly associated because the new scales aimed to capture maternal features that were not a sole reflection of the mothers' logical ability or educational experience. Nevertheless, I expected that mothers' educational qualifications and reading abilities would be more related to the Coherence, Reflectiveness and Openness scales, than to Relevance. This was because the first three factors are thought to reflect, to some extent, mother´s capacity to plan and structure her description of her children and understand and explain the child's development, whilst Relevance aimed to reflect primarily the mother's ability to be consistent and pertinent, which is independent of educational attainment and reading ability (Bakermans-Kranenburg & Van IJzendoorn, 1993).

The discriminant validity aims to test whether concepts or measurements which are supposed to be unrelated are, in fact, unrelated (Campbell & Fiske, 1959; John & Benet-Martinez, 2000). Therefore, a successful evaluation of discriminant validity shows that a test of a concept is not highly correlated with other tests designed to measure theoretically different concepts. To examine the discriminant validity, it was investigated whether the maternal scales; ratings were associated with two EE subscales: warmth and negativity. These measures were used to test whether the maternal scales assessed different narrative features to existing EE codes. The EE measure in developmental psychopathology is distinguished by 4 key features: (1) It focuses on individual-specific expressed emotions (i.e. individual with respect to both the person expressing

and the child receiving); (2) it refers to emotions observed in the manner an adult talks about a child, rather than by answers to specific closed questions; (3) it uses both verbal and vocal elements in rating emotions (that is, both *what* is said and the *tone* of voice used); and (4) its focuses on emotions regarding the child as an individual, rather than on those concerned with a child's symptoms. As the EE measures were also extracted from the same speech sample, weak to moderate associations to the maternal scales were expected.

Furthermore, it was tested for the effect of three potential biases: 1) interviewer, as differences in interviewing styles could have influenced the maternal narratives; 2) children's gender, because mothers could have experienced specific difficulties related to bringing up boys or girls; and 3) interview order between the first and the second twins as elder twins were always described by mothers first, at the beginning of the home visit. It is possible that the rapport between mothers and interviewers was still lukewarm at that stage, influencing the quality of the discourse. The maternal scales' ratings should not be influenced by these three potential biases. First, because the interviewers participated in a 15 day training programme on the interview protocols to ensure rigorous and standardised assessments and to be able to quickly establish a good rapport with the mothers. Second, the maternal scales were designed to capture the structural aspects of the narratives which were not thought to be related to the children's gender, but to the mothers' capacity to describe their children. After testing for potential biases, a structural analysis of the maternal scales was carried out to verify the internal consistency of the scales.

Validated scales that could consistently and reliably assess the structure of maternal descriptions of their children with relatively minimal training and time requirements for coding could represent a needed development to existing research methods and clinical practice. This contribution could allow further investigation into the complexities of the information available in the maternal narratives and deepen our understanding of the associations between maternal descriptions of their children, quality of parent-child interactions, parenting styles and children's behaviour problems.

3.2 Objective of the study

The aim of this study was to develop a new set of valid scales depicting how mothers organise, structure and relay information about their children. First, I tested the feasibility of deriving the maternal scales and refined the proposed coding scheme through two pilot studies. Second, I investigated the psychometric properties of the maternal scales, including 1) the inter-rater reliability for each scale; 2) the temporal stability of the ratings derived from the maternal narratives gathered at ages 5 and 10; 3) the construct validity of the maternal scales by testing the maternal versus child specificity of the scales and comparing maternal scores across monozygotic and dizygotic twins. Additionally, I examined the convergent and discriminant validity, by testing the associations between maternal scales and measures of socio-economic deprivation, mothers' educational level and expressed emotion; 4) indicators of potential biases, including interviewer, child's gender and interview order; and 5) the internal structure of the maternal scales.

3.3 Methods

This present study used 1,050 maternal narratives, derived from semi-structured interviews based on the FMSS procedure (Magaña et al., 1986). Interviews were conducted with 525 mothers of twins from the E-Risk Study (Environmental Risk Study) and all information was gathered by seven interviewers. I was one of them and was personally responsible for interviewing 148 families during home visits when the children were aged 10. Maternal narratives were collected separately for each twin when the children were 5 and 10 years old. However, data from the age 10 assessments were used to test the main hypotheses. The narratives gathered at age 5 were used to investigate the stability of the maternal scales only. The longitudinal research design allows the examination of the temporal stability of the ratings and the investigation of the direction of the associations found between the maternal scales and mothers' and children's characteristics. The narratives used for this study were randomly selected by the E-Risk data manager through a computer procedure which generated a random list of families' identifying numbers. I was personally responsible for 1) conceptualizing this study; 2) generating

the hypotheses; 3) designing the coding procedure for the new maternal scales; 4) conducting the two pilot studies; 5) carrying out the codification for 1,050 maternal narratives; 6) training a second rater to test the inter-rater reliability of the new maternal scales; 7) deriving all variables and 8) conducting all statistical analyses. A detailed description of the sample and methods, including coding procedure, is contained in the previous chapter.

The next section describes in detail the steps taken to assess the feasibility of deriving, the reliability and the psychometric properties of, the maternal scales. By way of introduction, the table below (Table 3.1) summarises these steps.

Table 3.1: Assessment Plan of the Psychometric Proprieties for the Maternal Scales

Analysis	Objectives	Measures	Sample
Pilot study 1: Feasibility	Test the utility and feasibility of deriving the scales	4 Structural scales 5 Content scales	20
Pilot study 2: Overview of the maternal scales' distribution	Test the coding scheme	4 Structural scales 6 Involvement indices	96
Inter-rater reliability	Test the association between two raters´ coding	4 Structural scales 6 Involvement indices (phase 10)	30 for each rater
Temporal stability	Test the association between the scores on the scales over time	4 Structural scales, 6 Involvement indices (phases 5 and 10)	28 at each time
Construct validity	Examine the associations between the maternal ratings across twins and zygosity	4 Structural scales, 6 Involvement indices, twins' zygosity	1050
Convergent validity	Test whether the scales are influenced by SES disadvantage and mothers' educational level	4 Structural scales, 6 Involvement indices, SES, mothers' age when left high school, highest educational attainment and reading ability	1050
Discriminant validity	Examine associations between maternal scales and expressed emotion	4 Structural scales, 6 Involvement indices and EE warmth and negativity	1050
Potential bias	Assess for potential biases: interviewer, children's gender and interview order	4 Structural scales, 6 Involvement indices, interviewer, children's gender and interview order	1050
Internal structure of the maternal scales	Determine whether the scales were related to one another and if they could be merged	4 Structural scales	1050

3.3.1 Pilot study 1: feasibility

The first pilot study aimed to assess the feasibility of deriving the maternal scales, to establish whether the scales were adequately formulated and to identify potential problems with the coding system before pursuing the codification with a large number of speech samples. The first pilot study was conducted using 20 randomly selected maternal FMSS from all mothers who agreed to be interviewed when the twins were 10 years of age. This subsample included mothers from high-risk families (80%), mothers of boys (60%) and mostly mothers of MZ twins (90%). The feasibility of deriving the new scales was tested by 1) applying the coding procedure to examine whether the definitions were clear; 2) looking at the frequency distribution of the maternal scales as an exploratory procedure; and 3) reviewing how different coding categories were distributed in the sample to check whether the utility of the scales would be compromised by a lack of variability within the maternal narratives caused either by a floor or ceiling effect.

3.3.2 Pilot study 2: frequency distribution of the maternal scales

The second pilot study aimed to create and refine scales orientated to measure structural features of maternal narratives. One hundred speech samples were considered for the pilot study 2. However, technical problems were experienced with four interviews, which were unintelligible. The final sample for this study included 96 maternal narratives. This sample included 41.7% MZ and 58.3% DZ twin pairs. In comparison to the E-Risk sample, it included mothers from high-risk families (54.2%) and a higher proportion of twin girls (62.5%). To explore further the feasibility of deriving the new scales based on the adjusted coding procedure, I checked the frequency distribution of the scales and conducted Spearman correlations to examine the associations between the scales and five out of six Involvement indices generated as a result of pilot study 1. One Involvement indices (i.e. Interviewer) was excluded from this later analysis, as it was a categorical variable. Non-parametric statistics were used as the scales were ordinal and not normally distributed.

3.3.3 Psychometric characteristics of the maternal scales

After completing Pilot Study 2, I coded the entire sample of 1,050 maternal narratives collected when the children were aged 10. Please refer to the previous chapter for a detailed description of the study sample. Once coding of the narratives was completed, I again examined the frequency distribution and the Spearman associations between the maternal scales and the six Involvement indices.

i. Inter-rater reliability

A second rater with postgraduate qualifications in Social Sciences was trained to code the speech samples for the new maternal scales. The training required seven hours of supervision and was completed through the codification of 10 randomly selected maternal narratives. The scores from this additional rater were compared to the main rater´s scores for a separate sample of 60 maternal narratives. The two raters were blind as to the characteristics of the participants. The inter-rater reliability was tested using Intraclass Correlation Coefficient.

ii. Temporal stability

The stability of the maternal scales was tested using maternal narratives from the interviews conducted with mothers when the children were 5 and 10 years using Spearman correlations. Thirty maternal narratives were randomly selected. From these 30 families, the narratives were available for 28 families at age 5 as one mother did not give her consent to have the interview recorded and technical problems impeded the proper recording of one other interview.
If weak, the associations between the maternal scales derived at two different developmental stages may indicate that the new scales captured transient maternal reactions to children's behaviours that were specific to the developmental stage. However, if these associations were

strong, these results could indicate that the maternal scales tapped into maternal features that were independent of the children's ages and behaviours. Alternatively, strong associations could reflect the stability of children's characteristics. Nevertheless, in a five year period, this possibility is remote, but it could be tested by investigating the temporal stability of children's behaviour during this five year period.

iii. Construct validity of the maternal scales

To strengthen the assessment of the psychometric proprieties of the new coding scheme, the construct validity of the maternal scales was tested first by investigating whether the scales assessed maternal specific or child dependent characteristics and second, by testing the convergent and discriminant validity of the scales. The hypothesis was that the way mothers think about, organise and relay their ideas about their children represent specific maternal characteristics. To test whether the maternal scales captured features that were either maternal or child specific, the associations between narrative scores across twins within a pair were investigated using Spearman correlations for the total sample, according to the twins' zygosity. The maternal scales' scores were expected to be highly correlated between twins, as it was hypothesised that they were measuring mothers' cognitive ability to process and relay information about their children, rather than examining increased differences between children's behaviour. The convergent and discriminate validities of the maternal scales were then explored. For the convergent validity, measures expected to be related to the maternal scales' ratings were identified: socio-economic deprivation, mothers' educational levels and cognitive skills. The discriminant validity was tested by examining whether the maternal scales captured distinct features of the maternal narratives from the EE measures, which were coded independently.

1) Socio-economic Disadvantage

The socio-economic disadvantage scale was a count of six items, which were defined as follows: (a) head of household has no educational qualifications; (b) head of household is employed in an unskilled occupation or is not in the labour force; (c) total household gross annual income is less than £10,000; (d) family receives at least one government benefit, excluding disability benefit; (e) family housing is government subsidised; and (f) family has no access to vehicle. Alpha reliability was .79 (Kim-Cohen, Moffitt, Caspi, & Taylor, 2004). Summing across these six items yielded a composite index of SES disadvantage, ranging from 0 to 6 (M=1.48, SD=1.77) for the sample used in this study.

Mothers who experience severe socio-economic disadvantage tend to have lower levels of education, live in a more chaotic environment and have less social support (Aber, Jones, & Cohen, 2000; Duncan, Brooks-Gunn, & Klebanov, 1994; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Lugo-Gil & Tamis-LeMonda, 2008) and these factors, partly captured by SES disadvantage, could affect mothers' ability to describe their children clearly, consistently, thoughtfully and openly. I used Spearman correlations to test the associations between maternal scales and socio-economic deprivation.

2) Mothers' educational levels and cognitive skills

Mothers completed the reading subtest of Wide Range Achievement Test (WRAT-3; Wilkinson, 1993), which evaluates basic reading skills. Mothers read, on average, at the high school level (M = 94.80, SD = .42, range 44 – 120, primary school to college). We also asked the mothers how old they were when they finished secondary school during the phase 5 interview. The scores ranged from 5 (mothers who never attended school) to 19 years of age (M = 16.07, SD =.03). Finally, we asked the mothers if they had an educational qualification when the twins were 5 years of age. If the answer was no, they received a score of 0, if yes, they received different scores according to their highest qualification level: 1 for Certificate of Secondary Education (CSE: Grade 2 , 3, 4, 5) or GCSE (D, E, F, G); 2 for CSE (Grade 1) or 'O' level (A, B, C) or GCSE (A, B, C); 3 for 'A' level, 'S' level; 4 for Higher National Certificate (HNC); 5 for Higher National

Diploma; 6 for Undergraduate degree; and 7 for Postgraduate qualification (e.g., Masters, PhD). The scores ranged from 0 (no qualifications) to 7 (postgraduate qualifications) (M = 2.21, SD =.06).

3) Expressed Emotion (EE)

The E-Risk study used a novel approach to scoring EE, given concerns that have been raised about the developmental inappropriateness of the standard scoring protocol originally developed for studies of adult psychiatric patients (Daley et al., 2003; McCarty & Weisz, 2002; Sandberg et al., 2003). Specifically, it used a 5 minute speech sample to elicit expressed emotion about each child. Trained interviewers asked the caregiver to describe each of their children ("For the next 5 minutes, I would like you to describe [child] to me, what is [child] like?"). The mother was encouraged to talk freely with few interruptions. However, if the mother found this difficult, the interviewer could aid the mother with a series of semi-structured probes, such as "In what ways would you like [child] to be different?" Interviews about each twin were separated in time by approximately 90 minutes. All interviews were audiotaped with the mother's consent. Data for EE were missing for 9% of the sample, due to the fact that some mothers did not wish to be audio-taped or, more commonly, technical problems with the tape. Two trained raters coded the audiotapes according to guidelines adapted from the FMSS scoring manual and modified for use with preschool children (see also, Daley et al., 2003; Sandberg et al., 2003). The raters underwent two weeks of training about coding expressed emotion. Inter-rater reliability was established by having the raters individually code audiotapes describing 40 children. The same rater coded both twins in the same family. The rater was blind to all other Study data. We examined 2 variables coded from the 5 minute speech sample: maternal warmth and maternal negativity. Additional information about the measurement, reliability, and concurrent validity of maternal EE is reviewed by Sandberg et al (2003).

Warmth is a global measure of the whole speech sample. The scale refers only to the warmth expressed in the interview about the child. The warmth of the respondent's personality was not a

consideration, nor was warmth shown towards others. Positive comments in themselves were not viewed as evidence of warmth, nor were stereotyped endearments. Warmth was assessed by the tone of voice, spontaneity (e.g. "she is so funny, - the other day she made up a song and she was dancing and singing in the garden…the song was about everything…a butterfly flew by and that ended up in the song…it was so sweet."), and sympathy and/or empathy towards the child (e.g. "I feel really sorry for her, it is not her fault…I worry for her." Warmth was coded on a six-point scale. (5) *High warmth* and (4) *Moderately high warmth* were coded when there was definite and clear-cut tonal warmth, enthusiasm, interest in, and enjoyment of, the child. For example, "she is a delight, she is so happy, I love taking her out, she is my ray of sunshine" was coded as a 5. (3) *Moderate warmth* was coded when there was definite understanding, sympathy and concern but only limited warmth of tone; for example, "I worried about her when she went to school, I thought she may have difficulty in mixing and I felt sorry for her." (2) *Some warmth* was coded when the mother showed a detached, rather clinical approach and little or no warmth of tone, but moderate understanding, sympathy and concern. For example, an interview along the lines of "she's alright" with little substantiation would have received this rating. (1) *Very little warmth* was rated when there was only a slight amount of understanding, sympathy, concern, enthusiasm about, or interest in the child. (0) *No warmth* was reserved for mothers who showed a complete absence of the qualities of warmth as defined. The scores ranged from 0 (No warmth) to 5 (High warmth) (M = 3.23, SD =1.04). The inter-rater agreement rate was r = .90.

Negativity is a global measure of the whole speech sample. The six-point rating scale refers to the negativism expressed in the interview about the child. (0) No negativity was coded when the mother made no negative comments about the child. (1) A *little negativity* was coded when the mother made one minor criticism such as, "she is lazy." (2) *Some negativity* was coded when the mother made two criticisms which were stronger in tone than the former rating. The next three codes were considered present when maternal negativity was generalised to the child himself/herself rather than against particular behaviours or attributes. These ratings were used when the tone and content of the interview were primarily negative. (3) *Negative - some dissatisfaction* was coded when the mother repeatedly mentioned one or two particular traits of

the child that she did not like and wished to change; for example, "she is not very clever, it would help if she tried more, but she doesn't, I wish she would try more, like her sister." This was the general theme of this particular EE interview with the mother, which was thus rated a 3. (4) *Negative - makes disparaging remarks and finds fault with the child* was coded when the mother had very little good to say about her child, and found fault in almost everything he/she did; for example, "She always does it, I have never met such a clumsy child, we think 'oh here we go again, she's done it again,' it drives me mad, why doesn't she look where she is going, I'm constantly having to look out for her, she's constantly breaking things…sometimes I think she is stupid, she never learns." (5) *Resentful and hostile* was coded when the mother gave the impression that she actively disliked the child. The interview would take the form of a stream of negativity against the child, with no positive comments; for example, "I wish I had never had her…she's a cow, I hate her." The scores ranged from 0 (no negativity) to 5 (resentful and hostile) (M = 1.58, SD =.97). The inter-rater agreement rate was r = .84.

iv. Potential bias

First, it was tested whether different interviewers, through disparities in their interviewing styles or their level of experience in performing the interview, affected the maternal scales' mean values. This was done by examining whether the narratives which received the lowest two ratings, such as incoherent and very incoherent, tended to be conducted by the same interviewers. Second, the discrepancies between boys and girls on percentages of narratives, which received the two lowest scores (0-1) for the four maternal scales, were examined. Differences were compared using chi-square test. Finally, the frequencies of the lower two scores in relation to the elder twins, who were always the subjects of the first interview, were examined to see whether these were different from those obtained in regard to the younger twins.

v. Internal structure of maternal scales

The internal structure of the maternal scales was examined using Spearman correlations to assess the associations between the scales and conducting a factor analysis to identify the number of factors that could explain the observed correlations among the maternal scales. The communality (h^2) which is the square of the factor loadings for that variable, or the square of the correlation between that variable and the common factor, was also obtained. These indices are used to describe the percentage of variance shared between the scales. Factor analysis works on the assumption that all variance is common and, for that reason, before extraction all the communalities are 1. After extraction, one can see the extent to which this variance is common and whether the maternal scales should be combined.

3.4 Results

3.4.1 Pilot study 1: testing feasibility

Table 3.2 shows the results from the first pilot study. Findings indicated that most narratives were very coherent (65%), pertinent with minor inconsistencies (90%), very reflective (50%), and open with rich descriptions of the children (60%). The emotional tone displayed by the mother did not match the content of their descriptions for 35% of the narratives (Table 3.3). For example, one mother described her child's difficult or challenging behaviours, laughing: "he is very naughty (laughs). His mouth is like a dustbin (laughs)". In addition, verbal abuse was observed in 10% of the narratives; for example one mother referred to her child as "nasty" and another described her son as a "nutter". Despite these extreme cases, most mothers seemed to refer to their children with either little (55%) or strong affiliation and pride (45%). Physical punishment was described as a common form of disciplining in 10% of narratives, whilst the majority of mothers collaborated with the interview procedures (90%).

Table 3.2: Frequencies for the Structural Scales in Pilot Study 1 (N = 20)

Structural scales	Frequency	Percentage
Coherence	N	%
Very incoherent	1	5
Incoherent	2	10
Coherent	4	20
Very Coherent	13	65
Relevance		
Irrelevant and inconsistent	0	
Evasive and dismissive	0	
Pertinent w/ inconsistencies	18	90
Pertinent and consistent	2	10
Reflectiveness		
No evidence of reflection	1	5
Poor level of reflection	5	25
Reflective	4	20
Very reflective	10	50
Openness		
Very restrained	0	
Strong avoidance	2	10
Some reticence	6	30
Very open	12	60

Table 3.3: Frequencies for the Content Scales in Pilot Study 1 (N = 20)

Content scales	Frequency	Percentage
Incongruent affect	N	%
0	13	65
1	4	20
2	1	5
3	1	5
7	1	5
Verbal abuse		
0	18	90
1	2	10
Affiliation and pride		
0	0	
1	11	55
2	9	45
Non-compliance		
0	18	90
1	2	10
2	0	
Punishment		
0	18	90
1	2	10

Observations from the first pilot study suggested that mothers' brief speech samples contained enough information to code for the following Structural scales: Coherence, Relevance, Reflectiveness and Openness. However, a few difficulties were detected with the Content scales, which aimed to assess the emotional content of maternal narratives and practical aspects of parenting behaviour. Scales such as affiliation and pride, verbal abuse and punishment, although having different aims from existing narrative measures, seemed to capture characteristics which were likely to overlap with the emotional content explored by EE codes (i.e. maternal warmth and negativity). Finally, mothers' non-compliance did not occur in the pilot study and this was possibly because of the well-trained and experienced interviewers. In light of these observations from Pilot Study 1, the Content scales were discarded and the aims of the thesis were refined. From this point onwards, I limited the scope of my study to develop and test an innovative coding procedure for maternal narratives that did not replicate existing measures and focussed on investigating structural features of maternal narratives. I concentrated thus my doctoral research on four maternal scales: Coherence, Relevance, Reflectiveness and Openness.

Additionally, in Pilot Study 1, concerns were raised about the potential subjective nature of the four Structural scales and, consequently, the possible difficulties in establishing their reliability and validity. It was also identified that, despite interviewers being instructed to encourage mothers to talk for 5 minutes about their children, the length of the interviews seemed to vary and differences in the duration of the interviews could potentially influence the maternal scales' ratings. For these reasons, before conducting the second pilot study, six Involvement indices were added, to (1) examine factual aspects of maternal narratives; (2) provide additional information on any likely problem areas; and (3) verify the accuracy and consistency of each scale. Table 3.4 summarizes the changes carried out in the coding scheme for the maternal scales following the initial pilot study. Structural scales were strengthened, content scales were dropped and involvement indices were added.

Table 3.4: Changes to the Coding Scheme for Maternal scales

Pilot Study 1	
Structural scales	**Content scales**
Coherence	Incongruent affect and sarcasm
Relevance	Verbal abuse
Reflectiveness	Punishment
Openness	Affiliation and pride
	Non-compliance
Pilot Study 2	
Structural scales	**Involvement indices**
Coherence	*Number of digressions*
Relevance	*Time of first digression*
Reflectiveness	*Number of prompts*
Openness	*Time of first prompt*
	Length of the interview
	Interviewer

The six Involvement indices added were:

a) Number of digressions and time of first digression

Digression was defined as any significant shift in the narrative that leads the maternal speech away from the description of the targeted child. It included any references to another child, including the co-twin or descriptions of the twin pair, or another family member, including the mother herself. Exceptions were instances when the mother compared the twins, after being prompted by the interviewer, or when she mentioned the co-twin to better describe the child in question. The time when the first digression occurred, in seconds, aimed to consolidate the reliable coding of the digression measure between the raters. By coding the number of digressions and time of first digression, I aimed to complement the Coherence and Relevance scales, as I expected that incoherent and irrelevant narratives would include higher number of digressions earlier in the interview.

b) Number of prompts and time of first prompt

Number of prompts measured the number of times the interviewer intervened to assist the mother in describing the child. Number of prompts was expected to be associated with the Openness scale because mothers who were more willing to describe their children would be less likely to need prompting than those who had more difficulty describing their children.

The time of the first prompt, in seconds, recorded when in the interview the mother required prompting by the interviewer. It was expected to be associated to the Coherence scale, as interviewers would be more likely to prompt a mother whose narrative was marked by significant shifts and unrelated events, making it harder for them to follow the mothers' descriptions. This index was also thought to be relevant to the Reflectiveness scale because mothers, whose narratives were more thoughtful and aware of the child's development, were likely to find the task easier and would, consequently, need less support and prompting by the interviewers.

c) Length of the interview

This index, in seconds, was included to test whether differences in the length of the maternal narratives influenced the coding for all four maternal scales.

d) Interviewer

As the speech samples used in this project derived from semi-structured interviews, small differences in interviewing styles could be a factor influencing the administration of the interview and, consequently, the maternal scales' ratings. Thus, this marker was included to control for the possibility that the coding of the maternal scales was not affected by interviewer bias. This question will be examined in the results section for Pilot Study 2 and revisited, in greater detail, when testing for potential biases. Once again, this indicator referred to all four maternal scales.

3.4.2 Pilot Study 2: frequency distribution of the maternal scales

The maternal scales were derived from 96 randomly selected maternal narratives after the adjustments made to the coding scheme. Preliminary analyses were carried out to check the frequencies of the four maternal scales. Results, in Table 3.5, indicated that most narratives were coded as very coherent (80.2%), pertinent and consistent (53.1%), very reflective (78.1%) and open (77.0%).

Table 3.6 presents the descriptive statistics for the Involvement indices. Most of the narratives showed no signs of digression (85.4%). However, when mothers digressed it was most likely to occur at the very beginning, within the first minute. Most mothers who needed prompting (7.3%) were prompted sometime between the first and third minute of the interview and received on average 3 prompts (M = 3.61, SD = 2.61). As the interview protocol stipulated three mandatory probes, findings were grouped based on whether the interviewer had used up to the three mandatory prompts or more. The average length of the interviews was near the stipulated duration of 5 minutes, or 300 seconds (M = 310.72 seconds, SD = 105.60 and ranged from 150 to 623 seconds, N = 46). The speech samples used for Pilot Study 2 were distributed across

interviewers, apart from interviewers 6 and 8 who visited a very small number of families. The data for Interviewer 8 represented the amalgamation of two interviewers, who carried out a very small number of interviews. I will explore the associations between the Interviewer and maternal scales' ratings in more detail when investigating potential biases in the following subsection.

Table 3.5: Pilot Study 2 for the Maternal Scales (N = 96)

Scale	Frequency N	Percentage %
Coherence		
Very incoherent	2	2.1
Incoherent	4	4.2
Coherent	13	13.5
Very Coherent	77	80.2
Relevance		
Narcissistic or preoccupied	4	4.2
Evasive and dismissive	6	6.2
Pertinent with minor inconsistencies	35	36.5
Pertinent and consistent	51	53.1
Reflectiveness		
No evidence of reflection	2	2.1
Poor level of reflection	12	12.5
Reflective	7	7.3
Very reflective	75	78.1
Openness		
Very restrained	4	4.2
Strong avoidance	7	7.3
Some reticence	11	11.5
Very open	74	77.0

Table 3.6: Preliminary Frequencies for the Involvement Indices (N = 96)

Indices		Frequency N	Percentage %
Number of digressions			
0		82	85.4
1		7	7.3
2		3	3.1
4		1	1.0
6		1	1.0
11		1	1.0
18		1	1.0
Time of first digression			
Not applicable		82	85.4
Within 1st minute		7	7.3
Between 1 and 3 minutes		4	4.2
After 3 minutes		3	3.1
Number of prompts			
0 – 3		47	49
4 – 6		33	34.3
7 – 10		16	16.7
Time of first prompt			
Not applicable		82	85.4
Within 1st minute		7	7.3
Between 1 and 3 minutes		4	4.2
After 3 minutes		3	3.1
Interviewer	1	22	22.9
	2	14	14.6
	3	16	16.7
	4	14	14.6
	5	14	14.6
	6	2	2.1
	7	12	12.5
	8	2	2.0

The associations between the maternal scales and five of the indices were examined (Table 3.7). Results showed that Coherence and Relevance scales were inversely associated to number of digressions and time of first digression. Total number of prompts, Time of first prompt and Length of the interview were not associated to any of the four maternal scales. These results suggest that the maternal scales' ratings were not significantly associated with number of prompts, time of first prompt or the duration of the interview. Overall, mothers whose narratives were more incoherent and irrelevant were more likely to digress from the question asked. Results from Pilot Study 2 indicated significant associations between the maternal scales and the Involvement indices, suggesting that these were tapping into existing features of maternal discourse. After the second pilot study, I decided that the coding scheme was satisfactory and coded the whole sample.

Table 3.7: Spearman Correlations between Maternal Scales and Indices

	Number of digressions	Time of first digression	Number of prompts	Time of first prompt	Length of the interview
Coherence	-.21*	-.15*	-.17	.04	.05
Relevance	-.38***	-.34***	.04	-.08	-.27
Reflectiveness	-.10	-.07	-.19	.01	.18
Openness	.04	.07	-.19	.08	.07

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

3.4.3 Psychometric characteristics of the maternal scales

First the frequency distribution of the maternal scales was investigated (Table 3.8). The majority of the narratives were coded as being very coherent (60.4%), relevant with minor inconsistencies (67.6%), very reflective (62.2%) and very open (68.5%). Then the associations between the maternal scales' ratings and the Involvement indices were examined (Table 3.9). To account for the non-independence of the data, as there were two narratives (8 maternal scales' ratings) for

each mother, a mean score for each new scale for every participant mother was calculated. The Coherence scale was inversely correlated with the number of prompts, number of digressions and time of first digression. These results indicated that less coherent narratives were significantly more likely to contain more frequent prompting by the interviewer and to have a higher number of digressions early in the interview. The Coherence scale was also negatively correlated with the time of first prompt and the length of the interview. In other words, more coherent narratives tended to be more succinct and need less prompting earlier during the interview, whilst less coherent narratives tended to be longer and require earlier prompting. Table 3.9 also shows that the Relevance scale was strongly inversely correlated to the number of digressions and time of the first digression. The Relevance scale was also negatively correlated with the total number of prompts and the duration of the interview. These results suggested that less relevant narratives implied early and more frequent digressions, a higher number of prompts and longer interviews. The Reflectiveness scale was moderately inversely associated with number of prompts and number of digressions, but positively associated to time of first prompt, indicating that less reflective narratives emerged from mothers who digressed frequently and needed more and earlier prompting. The Openness scale was significantly correlated to the time of first prompt and negatively associated to the total number of prompts. Therefore, mothers who were less open and informative needed quicker and more frequent prompting by interviewers.

Table 3.8: Frequencies for the Structural Scales (N = 1050)

	Frequency	Percentage
Coherence	N	%
Very incoherent	15	1.4
Incoherent	98	9.3
Coherent	303	28.9
Very Coherent	634	60.4
Relevance		
Narcissistic or preoccupied	29	2.8
Evasive and dismissive	44	4.2
Pertinent with minor inconsistencies	710	67.6
Pertinent and consistent	267	25.4
Reflectiveness		
No reflection	48	4.6
Poor level of reflection	156	14.9
Reflective	193	18.4
Very reflective	653	62.1
Openness		
Very restrained	28	2.7
Strong avoidance	75	7.1
Some reticence	228	21.7
Very open	719	68.5

Table 3.9: Spearman Correlations between Maternal Scales (N =1050)

	Number of digressions	Time of first digression	Number of prompts	Time of first prompt	Interviewer	Length of the interview
Coherence	-.26***	-.08**	-.31***	.18***	.02	-.06*
Relevance	-.56***	-.42***	-.14**	-.00	.03	-.12***
Reflectiveness	-.16***	-.02	-.34***	.13***	.03	-.03
Openness	-.04	.04	-.45***	.30***	.04	.08*

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Overall, the frequency distribution and the pattern of associations between the maternal scales and Involvement indices indicate that the maternal scales measured existing structural features of narratives related to the Involvement indices. The results described so far suggest that the Involvement indices, which aimed to examine factual characteristics of the maternal narratives and provide information about any potential problem areas with the coding procedure, fulfilled their purpose of verifying the coding of the maternal scales. From this point onwards, I will focus my analysis on the maternal scales to explore the way mothers construct their narratives.

i. Inter-rater reliability

When exploring the inter-rater reliability, strong correlations were noted between the ratings for the four maternal scales. The Intraclass Correlation Coefficients varied from .76 for Coherence, .79 for Relevance, .81 for Reflectiveness and .79 for Openness. These findings indicate substantial agreement between the two independent raters and, consequently, good inter-rater reliability.

ii. Temporal Stability

Investigation of the temporal stability of the new scales showed that maternal scales' ratings derived from the maternal narratives obtained when children were 5 and 10 years were significantly associated with the Coherence, Reflectiveness and Openness scales (Table 3.10). The strength of the correlation coefficients (*rs* from .49 to .68, $p_s < .001$) denoted a moderate association across scales over time, indicating that the structural features captured by the maternal scales are stable over time.

Table 3.10: Spearman Correlations between Maternal Scales at Phases 5 and 10 (N = 28)

Age 5/10	Coherence	Relevance	Reflectiveness	Openness
Coherence	.57***	.28**	.54***	.59***
Relevance	.33***	.49***	.27**	.33***
Reflectiveness	.48***	.20*	.67***	.59***
Openness	.58***	.29**	.53***	.68***

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Alternatively, these strong associations could reflect the stability of the children's behaviour during this five year interval. Although this possibility is unlikely, I decided to test it by investigating the temporal stability of the children's behaviour during this period, as reported by their teachers, in order to prevent any additional informant bias. Pearson correlations coefficients showed weak association between teachers' reports on children's externalising behaviour (*rs*.11, $p_s < .01$) and internalising behaviour problems (*rs*.21, $p_s < .01$) at ages 5 and 10. Even when using only mothers' reports on children's externalising (*rs*. 30, $p_s < .01$) and internalising behaviour problems (*rs*. 38, $p_s < .01$) at ages 5 and 10, the associations across time were only moderate. These findings supported my hypothesis that the maternal scales were assessing mothers' characteristics that remained stable over a 5 year period.

iii. Construct validity

Construct validity of the maternal scales was also examined. Spearman correlations coefficients, in Table 3.11, indicated that the ratings for the maternal descriptions of elder and younger twins within each family were highly correlated, in particular, for Coherence, Reflectiveness and Openness scales. The lowest, but yet significant, association was found between the maternal ratings for the Relevance scale. These findings seemed to indicate that the maternal scales were measuring structural features which seemed to be related to mother´s individual ability to process and relay information about their children, rather than assessing

maternal behaviours that were dependent solely on the children's behaviour. Additionally, it suggests a slight difference in the pattern of results for the Relevance scale.

Table 3.11: Spearman Correlations for Maternal Scales between Twins (N = 1050)

Age 10	Elder twin			
	Coherence	Relevance	Reflectiveness	Openness
Younger twin	.			
Coherence	75***			
Relevance		.47***		
Reflectiveness			.79***	
Openness				.74***

Note. *** p <.001.

The results in Table 3.12 indicate that the maternal scales' ratings were significantly associated between twins, whether they were monozygotic or dizygotic twins, for all four scales. These correlations were particularly strong for the Coherence, Reflectiveness and Openness scales across the monozygotic group; whilst for the Relevance scale this relationship was stronger for the dizygotic twins. Thus, maternal descriptions of monozygotic twins tended to be more coherent, reflective and informative, whilst descriptions of dizygotic twins seemed to be more relevant.

Table 3.12: Spearman Rho Correlations for Maternal Scales between Groups of MZ and DZ Twins (N = 1050)

Age 10	Twin 2							
	Coherence		Relevance		Reflectiveness		Openness	
	MZ	DZ	MZ	DZ	MZ	DZ	MZ	DZ
Twin 1								
Coherence								
MZ	.77***							
DZ		73***						
Relevance								
MZ			.42***					
DZ				.51***				
Reflectiveness								
MZ					.84***			
DZ						.74***		
Openness								
MZ							.82***	
DZ								.62***

Note. *** p <.001.

Examining the associations between the maternal scales and different maternal characteristics indicated that the new scales were inversely correlated with SES disadvantage (Table 3.13). More specifically, Reflectiveness, Coherence and Relevance were moderately associated with SES disadvantage, whilst Relevance was only weakly correlated. These findings suggest that mothers who experienced higher levels of socio-economic deprivation tended to have more difficulty organising their thoughts and, consequently, structuring their narratives about their children.

Coherence, Reflectiveness and Openness scales were positively associated to maternal reading scores and highest educational qualification. In other words, mothers with high reading abilities and higher educational level had more coherent, reflective and open narratives. However, these associations were weak to moderate, suggesting that the maternal scales were measuring mothers' characteristics or abilities which were not a pure reflection of their educational achievement or reading skills. Relevance, however, seemed to be assessing different aspects of the maternal narratives.

The measures of EE were inconsistently associated to the maternal scales and, when significant, these correlations were of moderate or small magnitude (Table 3.13). More specifically, Coherence, Reflectiveness and Openness scales were positively associated to maternal warmth. Coherence was only weakly associated, whilst Reflectiveness and Openness were moderately related to maternal warmth. Correlations between the maternal scales and maternal negativity were weaker than those observed with maternal warmth. These findings indicate that maternal narratives expressing high warmth and low negativity towards their children tended to be slightly more coherent, reflective and open.

Overall, results indicated that the maternal scales were associated with socio-economic deprivation experienced by the mothers, their cognitive ability and education, but assessed different narrative features to the established measures of EE.

Table 3.13: Spearman Correlations between Maternal Scales and Mothers' Characteristics

Variables	Coherence	Relevance	Reflectiveness	Openness
Social demographic and academic qualification (N=1050)				
SES disadvantage	-.34***	-.08**	-.37***	-.32***
Reading scores	.35***	.09**	.32***	.31***
Age when left secondary school	-.20***	-.01	.21***	.22***
Highest educational qualification	.31***	.09**	.33***	.33***
Expressed emotion (N=1048)				
Maternal warmth	.24***	.08*	.38***	.33***
Maternal negativity	-.08*	.04	-.16***	-.03

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Biases may have influenced the maternal scales' ratings. To explore this possibility, three potential biases were examined in relation to the maternal scales' ratings: interviewer, children's gender and interview order.

iv. Potential Bias

A) Interviewer bias

Table 3.14 shows the proportion of narratives that received the lowest two scores for each maternal scale as a function of the interviewers. Interviewer 8 represented the amalgamation of five different interviewers who conducted a considerably small number of interviews. Even though the number of interviews conducted by each interviewer varied, the percentages of narratives with the lowest scores did not seem to vary for 6 of the 8 interviewers. In other words, the percentages reflected two patterns in the data: Interviewer 2 had the highest and Interviewer 6 the lowest percentages for Coherence, Relevance and Openness scales. For the Coherence scale, the percentages of narratives coded 0 or 1 varied from 6.7% to 13.5%. For the Relevance scale, the percentages of narratives rated 0 or 1 varied from 3.7% to 8.1%, suggesting the most consistency between the interviewers. For the Reflectiveness scale, the percentages of narratives coded 0 or 1 varied from 9% to 20.3%.Interviewer 5 had the highest percentage of narratives with the lowest two scores (28.2%) followed by interviewer 2 (25.7%). Finally, for the Openness scale, most narratives with scores of 0 or 1 were between 6% and 12.2% for the majority of interviewers. I was, however, unable to analyse the differences in frequencies across interviewers using chi-square, because the expected frequencies for Interviewers 6 and 8 were below the required minimum of 5.

Table 3.14: Percentages of the Lowest 2 Scores for the Maternal Scales by Interviewer (N = 1050)

Interviewer	Coherence ≤1		Relevance ≤1		Reflectiveness ≤1		Openness ≤1		Total number of interviews
	N	%	N	%	N	%	N	%	
1	14	7.0	12	6.0	9	14.8	13	6.4	203
2	29	17.4	20	12.0	43	25.7	28	16.8	167
3	20	13.5	12	8.1	30	20.3	18	12.2	148
4	9	6.7	5	3.7	16	13.4	8	6	134
5	24	12.8	24	7.5	53	28.2	23	12.2	188
6	1	1.7	1	1.7	7	11.7	1	1.7	60
7	11	11.7	5	5.3	18	19.1	10	10.7	94
8	5	9.0	4	7.1	9.0	9.0	2	3.6	56
Total	113		83		202		103		501

Overall, the percentages of narratives given the lowest two scores varied moderately in the data collected by 6 of the 8 interviewers. The exceptions were: the maternal narratives gathered by Interviewer 2, which received the lowest scores for each scale more frequently; and the narratives collected by Interviewer 6, which were rarely coded for the lowest two scores for the Coherence, Relevance and Openness scales. In order to understand the reasons behind this regular pattern, further analysis was needed.

One possibility was that the small percentage of narratives gathered by Interviewer 6 coded as the lowest scores reflected differences in interviewing styles, despite the interviewers' participation in a comprehensive two week training program. However, it is not likely that differences in interviewing styles would influence only one out of eight interviewers. Another possibility was that the variation found across interviewers reflected disparities in the subgroup of families assigned to each research worker. Interviewers were allocated subgroups of families across the UK and abroad. The main criterion used to allocate families was geographical area, in order to minimise costs and travelling time, and different geographical areas within the UK vary in socio-economic characteristics (Budd, 1999). Table 3.15 shows the average scores for SES disadvantage experienced by the participating families of each interviewer. Higher SES disadvantage scores indicated more socio-economically deprived families. The results suggest that Interviewer 6 assessed many families who experienced little socio-economic disadvantage (M=.73), which could partly explain this interviewer´s low percentage of narratives with lowest scores.

Table 3.15: Average Family Socio-Economic Deprivation across E-Risk Interviewers (N = 1050)

Interviewer	Mean	Std. Deviation	N
1	1.71	1.99	203
2	1.65	1.74	167
3	1.39	1.63	148
4	1.04	1.56	134
5	1.80	1.83	188
6	.73	1.47	60
7	1.56	1.75	94
8	1.03	1.44	56

B) Gender bias

No significant associations were observed between the children's gender and the percentages of narratives with the lowest scores on each maternal scale (Table 3.16). These findings indicate that the codification of the maternal scales was not influenced by children's gender.

Table 3.16: Frequencies of the 2 Lowest Scores for the Maternal Scales by Gender (N = 1050)

	Male		Female		Total	X^2
	%	N	%	N		
Coherence ≤1	54.9	62	45.1	51	113	1.54 $p = 0.21$
Relevance ≤1	57.5	42	42.5	31	73	0.11 $p = 0.74$
Reflectiveness ≤1	47	96	53	108	204	2.13 $p = 0.14$
Openness ≤1	51.5	53	48.5	50	103	0.03 $p = 0.86$

C) Interview order

The effect of the interview order was investigated by examining whether the narratives describing the elder twins differed significantly from those describing the younger twins. More specifically, it was examined whether the attribution of low scores on the maternal scales varied between the elder and the younger twins (Table 3.17). Non significant differences were observed between the narratives describing the elder and the younger twins, suggesting that the maternal scales' ratings did not vary due to the interview order.

Table 3.17: Frequencies of the Lowest 2 Scores for the Maternal Scales by Interview Order (N = 1050)

	Elder		Younger		Total	X^2
	%	N	%	N		
Coherence ≤1	51.3	58	48.7	51	113	.89
						p = 0.35
Relevance ≤1	49.3	36	50.7	37	73	.39
						p = 0.53
Reflectiveness ≤1	49	100	51	104	204	1.36
						p = 0.24
Openness ≤1	57.3	59	42.7	44	103	.83
						p = 0.36

Note. All tests were not significant at p<0.05 (2-tailed).

The associations between the four maternal scales were examined.

v. Internal structure of maternal scales

Results suggested that the four maternal scales were significantly interrelated and two distinct patterns of associations were identified (Table 3.18). The Coherence, Reflectiveness and Openness scales were highly associated, although moderate correlations were found with the Relevance scale. These findings suggest that mothers whose narratives were more coherent tended to express more awareness regarding the impact of positive and difficult experiences in children's lives and formulated more comprehensive and detailed descriptions. In addition, less evasive narratives tended to be more coherent, thoughtful and open.

Table 3.18: Spearman Correlations between Maternal Scales (N=1050)

	Coherence	Relevance	Reflectiveness
Relevance	.35***		
Reflectiveness	.65***	.31***	
Openness	.64***	.25***	.67***

Note. *** p <.001.

The Relevance scale may not be as highly correlated to the other scales because the study sample included twins. First, during the interview, mothers often referred to the children as "the twins" or "the children". These statements were coded as a digression when mothers referred to their other twin child continuously, as they had been instructed to describe only one child with an interval of approximately one hour between the two interviews. It is possible that mothers of twins find it hard to concentrate on describing one child at a time, consequently digressing more than mothers of non-twins. To mitigate this effect, trained researchers used probes during the interviews to focus mothers on describing one child at a time and this might have stopped the maternal narratives from meandering further, which could have affected the results.

Furthermore, it is possible that the three scales were strongly correlated because they were tapping into similar concepts, with Relevance standing apart. To test whether the maternal scales were measuring similar features of maternal narratives, a factor analysis was used to determine whether these three scales should be combined.

The Coherence, Reflectiveness and Openness scales shared 75% of their variance or more, whereas the Relevance scale had 35% of common variance with the other scales (Table 3.19). The Relevance scale could measure other aspects of the maternal narratives in addition to other common features of the mothers' description of their children. Table 3.20 presents the summary of the total variance associated with each factor, which represents the shared variance explained by that particular linear component. A two factors solution accounts for most of the variance shared between the four scales (85.53%).

Table 3.19 Summary of Exploratory Factor Analysis Results for Maternal Scales (N = 1050) Factor Loadings

Item	Factor 1	Factor 2	Communalities
Coherence	**.74**	.47	.78
Relevance	.30	**.42**	.35
Reflectiveness	**.80**	.24	.78
Openness	**.85**	.15	.75
Eigenvalues	2.36	.15	
% of variance	78.94	18.81	
Total variance		97.76	

Note: Method: iterated principal factors, rotation: orthogonal varimax.

Because the results above consistently showed two patterns of associations between the four maternal scales and other variables, a two factor solution was chosen to summarise the four scales. The Coherence, Reflectiveness and Openness scales were merged into one, from now on labelled Descriptive Reasoning, and Relevance was kept separate.

3.5 Discussion

This study aimed to develop a new set of valid scales to assess how mothers organise, structure and relay information about their children. This process was not a straightforward one. It involved many adjustments and, after initial analysis of the coding scheme in the first pilot study, the focus of the study moved to the structural features of maternal narratives. These modifications meant that the new scales would go beyond previous studies which explored the emotional content of the maternal speech. Consequently, a subgroup of five Content scales that measured more

factual information together with some emotional content of maternal narratives was disregarded. In addition, six Involvement indices were created with the purpose of strengthening inferences relating to the validity of the maternal scales.

Findings indicate that the Structural scales and Involvement indices are associated. These suggest that the maternal scales capture narrative features present in short speech samples. Results also indicate that the maternal scales' ratings are reliable and consistent across trained raters. Correlations demonstrate that the maternal scales' ratings are stable, with particularly strong associations observed for the Coherence, Reflectiveness and Openness scales, across a five year interval. The stability of the ratings is especially compelling when considering that five years is a long interval in early childhood and that children and their families usually experience significant changes over this period. These results thus suggest that the maternal scales tap into maternal attributes that are long-standing rather than merely providing a snapshot of a particular maternal characteristic at a given time. Similar findings have emerged from EE research, where good inter-rater reliability and modest stability of the EE ratings were found over a period of weeks or months (McGuire & Earls, 1994; Vostanis & Nicholls, 1995) and a two year follow-up (Peris & Baker, 2000). Additionally, studies examining the stability of the AAI have shown high stability over periods of months and years (Crowell, Treboux, & Waters, 2002; Hesse, 1999; Crowell et al., 1996). However, AAI stability was generally found to be lower in clinical or at-risk populations (Van IJzendoorn & Bakermans-Kranenburg, 1996).

With respect to the construct validity of the new maternal scales, results indicate that mothers' descriptions of their twin children are significantly associated to each other, regardless of whether they were MZ or DZ twins. These findings suggest that the maternal scales are achieving their aim of assessing mothers' abilities to process and relay information when describing their children, regardless of behavioural and other differences between individual children of the same mother. Similar research exploring differences in EE across MZ twins has suggested that differences in maternal EE predicted behavioural differences between genetically identical twins, indicating that the association between maternal treatment and children's antisocial behaviour

problems was not a function of genetic differences between children (Caspi et al., 2004). Therefore, it is likely that the maternal scales are capturing aspects of maternal cognitive functioning that are unrelated to the genetic or behavioural differences between the children.

In relation to the convergent and discriminant validity of the maternal scales, results suggest that the maternal scales are associated with levels of socio-economic disadvantage and maternal EE. Furthermore, modest associations between maternal scales with mothers' educational levels and cognitive skills indicate that the new scales measure concepts that go beyond mothers´ educational achievements and reading abilities that are often associated with intellectual performance. These results show that the mothers' abilities to structure and construct their narratives, as measured by the maternal scales, are not purely a reflection of their academic performance or educational experience. Mothers' academic ability or educational level did not seem, for example, to be strongly associated to their ability to detect and avoid logical inconsistencies in their narratives or to describe their children fluently. Similar findings were reported in AAI research, where AAI classification was not related to mothers' cognitive ability (Bakermans-Kranenburg & Van IJzendoorn, 1993; Crowell et al, 1996). Additionally, results indicate that the maternal scales were not being tainted by interviewers, children's gender or interview order.

A new variable, labelled Descriptive Reasoning was created by combining three of the scales as suggested by the results of a factor analysis. The word "descriptive" suggests a way of expression that is detailed, illustrative, eloquent and vivid, whilst the word "reasoning" brings to mind a way of thinking logically. This new scale captured this intersection between the way mothers think about, organise and structure their descriptions of their children and how informative, comprehensive and expressive these descriptions are. The new Descriptive Reasoning scale measured: 1) how mothers' descriptions of each child were constructed and organised; 2) whether there was evidence within the narratives that mothers acknowledged and understood that their child's development could be affected by both positive and negative circumstances; and 3) how detailed, informative and realistic the mothers' descriptions of their

children were. Relevance remained a separate scale because it consistently showed a different pattern of associations from the other three Structural scales. Reducing all the information collected into two scales, Descriptive Reasoning and Relevance, was an important step and from this point onwards the study will focus on two, rather than four, maternal scales.

Although this study provides a great deal of supporting evidence with respect to the psychometric properties of the maternal scales, in particular their reliability, stability and validity, certain limitations have to be taken into account. First, it was conducted with a sample of mothers only, which limited my ability to generalise these findings to all primary caregivers and/or fathers. Second, it is not clear whether the same results would have been obtained using clinical samples. Third, it could be argued that the specific cultural context of this study, which was conducted mostly in the UK, meant that only tentative conclusions about the psychometric properties of the maternal scales in general could be derived. Fourth, the inter-rater reliability of the maternal scales was examined comparing the ratings across only two raters. Future research could strengthen knowledge of the number of raters required. Fifth, the interviewers were trained to conduct the interviews in a friendly but task-oriented atmosphere which may have minimised the influence of the interviewer or the interview order on mothers' ratings. In addition, because this sample consisted of mothers of twins, it is possible that this peculiarity may have influenced results. Sixth, the small number of narratives that received the lowest two scores limited statistical analysis. Future replication studies investigating speech samples from mothers and fathers of singletons**,** clinical groups and samples from different cultures will help clarify these issues and determine how far our results can be generalised outside of this particular sample group.

The two maternal scales assess 1) the level of coherence, thoughtfulness and reflection; and 2) the level of consistency and relevance, present in the maternal narratives. Results consistently indicate that the maternal scales are reliable, stable and valid measures of maternal narratives.

A key question that arose from these findings was whether the maternal scales could be associated with other maternal characteristics, including mother's personality and personal history of psychopathology. The following chapter will investigate whether the way mothers

construct their descriptions of their children was associated with their personality characteristics, mental health history, substance abuse, experiences of victimization and parenting behaviour.

Chapter 4: Maternal Scales and Mothers' Characteristics

The present study extends prior narrative research by investigating whether mothers' functioning influences their descriptions of their children. More specifically, this chapter aims to examine whether mothers' 1) personality features; 2) mental health history; 3) experiences of victimization; and 4) parenting behaviour, were associated with their narratives' structural features, as assessed by the maternal scales. These individual characteristics are known to be related to mothers' cognitive functioning, but less is known about their associations with maternal narratives' structural features. Better understanding these associations may be useful to researchers and clinicians, as they often use mothers' descriptions of their children to assess the quality of the parent-child relationship and the children's overall development. By being able to identify which maternal characteristics may have a constructive or negative influence on their narratives' structural features, professionals could improve and expand their use of mothers' descriptions, making narrative measures more useful as a diagnostic and prevention tool.

4.1 Introduction

Research has distinguished five major domains of individual differences in human behaviour: personality, mental health, psychological interests, cognitive ability and social attitudes (Lubinski, 2000). Individual differences in these domains play a significant role in a number of important behaviours and outcomes, including delinquency, health risk behaviours and educational and work performance, directly affecting individuals, their families and the broader community (Lubinski & Humphreys, 1997). In other words, variations in what people feel, what they think and what they want largely determine differences in what they do. Congruently, research has showed that individual differences in personality features, mental health history, experiences of

victimization and parenting behaviour were related to a range of cognitive distortions (Adam et al., 2004; Bosquet & Egeland, 2001; Harvey, Watkins, Mansell, & Shafran, 2004; Lonigan, Vasey, Phillips, & Hazen, 2004; Muris & Field, 2008; Muris, Meesters, & Rompelberg, 2007; Stovall-McClough & Cloitre, 2006). It is therefore likely that differences in mothers' individual characteristics could influence the way they think about and describe their children. This chapter seeks to shed light on those influences by exploring the associations between mothers' characteristics and their narratives' structural features.

4.1.1 Mothers' personality

Personality research explores the consistencies and differences between individuals´ recognition and description of their feelings, thoughts, wants and actions and attempts to explain these differences in terms of a set of quantifiable hypotheses (i.e. why one feels, thinks, wants and does) (Revelle, 2007; Ozer & Benet-Martinez, 2006). Applying this paradigm in light of previous findings that individual differences in personality, including anxiety levels or avoidance tendencies in the context of new circumstances and poor abilities to sustain and shift attention, were related to cognitive distortions (Lonigan et al., 2004; Muris et al., 2007), I considered whether differences in personality features might influence mothers' cognitive functioning. I did this by examining whether individual differences in mothers' personalities were linked to the way they structured their descriptions of their children.

Current personality research most commonly uses a conceptual framework emphasising five basic dimensions: conscientiousness, openness to experience, extroversion, neuroticism and agreeableness (Costa & McCrae, 1992). A conscientious person is generally orderly, dutiful, responsible, competent and thorough. People with high openness to experience tend to have broad interests, be liberal and like novelty, whereas people with low scores in this dimension tend to be more conventional, conservative and prefer familiarity (Howard & Howard, 1995). Extroverts

tend to be more adventurous, assertive, frank, sociable and talkative, whilst introverts may be described as quiet, reserved and shy (Costa & McCrae, 1992). Low levels of neuroticism indicate emotional stability, whilst high neuroticism reflects a more reactive, worried and temperamental personality, more easily bothered by environmental stimuli (Howard & Howard, 1995). An agreeable person tends to be more altruistic, kind, empathic and emotionally supportive, being less self-centred, hostile, indifferent, jealous and competitive. Differences in personality features were shown to largely determine variations in what one feels, perceives, thinks and does. It is therefore likely that personality features influence the way mothers organise their impressions and thoughts about their children and structure their descriptions.

From these five personality dimensions, two in particular captured the attention of previous researchers exploring the relationship between personality and cognitive bias during verbal tasks: neuroticism and conscientiousness. Eysenck (1992a, 1992b) argued that individuals who scored high on the neuroticism scale were more prone to bias during information processes due to their hypervigilance in relation to threat. Specifically, their heightened anxiety reduced their cognitive ability to process and store information during verbal exercises that required complex attention and coordination, when compared with those who scored low on the neuroticism scale. Neuroticism was positively associated with attentional bias (i.e. poor ability to focus, maintain and shift attention at will) and interpretation bias (i.e. reduced ability to decode ambiguous stimuli) (Hadwin, Fros, French, & Richards, 1997; Muris et al., 2007; Muris & Field, 2008). Neuroticism has consistently been shown to reduce participants' attention span and limit their ability to accurately process information during verbal tasks (Stewart, Deary, & Ebmeier, 2002). Therefore, based on existing literature, it is likely that neuroticism could be associated with the way mothers formulate and structure their descriptions of their children, as measured by the maternal scales. For example, mothers who scored high on the neuroticism scale may construct narratives with lower levels of coherence, relevance and reflection, as their heightened anxiety may reduce their ability to focus and process information during a complex verbal task.

Conversely, a proxy of conscientiousness called effortful control (i.e. the capacity to regulate one's attention and behaviour), has been shown to protect against cognitive distortions (Rothbart & Bates, 1998). This personality characteristic has been linked to a decreased susceptibility to cognitive distortions during information processing tasks, as it increases one's capacity to organise incoming stimuli, maintain a calm state of mind, delay gratification, tolerate change and create an appropriate cognitive and behavioural response to selected stimuli (Derryberry & Reed, 2002; Lonigan et al., 2004; Muris et al., 2007). Thus, I hypothesised that mothers who scored high on the conscientiousness scale would formulate narratives with higher levels of coherence, relevance and reflection due to their ability to remain focussed and select and process stimuli in a calm and organised way during a complex verbal task.

Cognitive deficits are known to be related to personality features, but research has not yet explored whether mothers' personality features are associated with the structural aspects of maternal narratives, as measured by the new maternal scales. By examining these associations, this chapter expands our knowledge on narrative research, making a unique contribution to research methods and also to clinical practice. This is because, particularly when evaluating young children, both researchers and clinical professionals (e.g. GPs, social workers and community mental health teams) often rely on mothers' descriptions of their children to form an initial assessment of children´s difficulties, investigate the quality of familial relationships and assess the emotional climate at home. With an improved understanding of the relationship between mothers´ descriptions of their children and mothers' individual personality features, these professionals will be better equipped to make such assessments based on maternal narratives.

4.1.2 Mothers' mental health history

Cognitive deficits are known to be widespread in psychiatric disorders, but less is known about the associations between mothers' mental health history and their narratives' structural features. Research has shown that psychopathology can affect cognition on many levels, including perception, thought and memory (Beck, Emery, & Greenberg, 1985; Eyseck, 1992a, 1992b; Hamilton, 1984; Harvey et al., 2004; Muris & Field, 2008). Severe cognitive distortions, which are commonly found in cases of mental health problems, could influence different stages of information processing, i.e. encoding (selecting information), interpreting (attaching meaning to the information that is selected), response search and selection (retrieving and choosing an appropriate response) and enactment (producing the selected response) (Salemink, van den Hout, & Kindt, 2010). A range of psychiatric illnesses, including the psychosis spectrum, depression, personality disorders, alcoholism and drug dependence, have been associated with reduced intellectual ability (David, Zammit, Lewis, Dalman, & Allebeck, 2008). These disorders were found to disrupt optimal performance in IQ tests and also to impair intellectual functioning in various settings. For example, studies investigating adults suffering from depression showed that participants' memory was compromised, in that they were able to recall general descriptions rather than specific memories (Goddard, Dritschel, & Burton, 1996; Kuyken & Dalgleish, 1995; McNally, Lasko, Macklin, & Pitman, 1995; Williams et al., 2007). This 'overgenerality' in memory was found, in particular, among women with a previous history of depression and suicide attempts, for whom intrusions of stressful memories of physical and sexual abuse were common (Kuyken & Brewin, 1995).

Substance abuse has also been associated with cognitive distortions, including poor memory, planning and decision making (Grant, Contoreggi, & London, 2000). Evidence showed that prompts associated with drug use triggered abnormal activity in the frontal cortex, even in the absence of the drugs, as 25% of drug users responded similarly to patients with frontal lobe damage and 40% appeared to be hypersensitive to potential rewards in a gambling task (Bechara et al., 2001). It is thus likely that mothers who have a history of psychopathology and/or

substance abuse could experience increased difficulty formulating coherent, consistent, reflective and informative narratives, due to compromised memory, planning and judgement.

Research exploring the associations between mothers' mental health history and their narratives' structural features has often used the Adult Attachment Interview (AAI: George et al., 1985), which analyses adults' descriptions of attachment related experiences. Studies indicated that women with preoccupied narratives (i.e. incoherent and incomplete descriptions with many irrelevant details) reported higher levels of psychopathology, including paranoia and psychotic-type symptoms, schizophrenia and depression (Dozier & Lee, 1995; Fonagy et al, 1996; Pianta, Egeland, & Adam, 1996; Rosenstein & Horowitz, 1996). Consistently, 63% of women whose attachment related narratives were classified as dismissing (i.e. brief but incomplete descriptions, marked by a lack of fit between memories and evaluations), 65% of those coded as unresolved (i.e. incoherent and irrelevant narratives marked by an extreme bereavement reaction and/or lapses in monitoring speech concerning experiences of loss or trauma) and 100% of those with preoccupied transcripts received psychiatric diagnoses (Ward, Lee, & Polan, 2006). These findings indicated that women's psychopathology was associated with the way they structured their attachment related narratives. It is thus likely that mothers' mental health could impair their ability to structure descriptions of their children. These associations, however, have not yet been measured, and this study aims to extend current research by exploring whether mothers' mental health history influences their narratives' structural features.

4.1.3 Experiences of victimisation

Experiences of victimisation in childhood, including physical, emotional and sexual abuse and neglect, were found to have long term effects on adults' cognitive functioning, by impairing their memory, verbal and performance intelligence, verbal comprehension and vocabulary (Bogels & Brechman-Toussaint, 2006; Capps, Sigman, Sena, & Henker, 1996; Creswell & O'Connor, 2006; Creswell, O'Connor, & Brewin, 2006; Hadwin, Garner, & Perez-Olivas, 2006). Results from a twin

study showed that exposure to adverse experiences in childhood, including high levels of domestic violence, was associated with impaired cognitive development and an average loss of eight IQ points among five year olds, after accounting for genetic influences (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). The environmental impact of childhood adversity on subjects´ cognitive, behavioural, emotional, psychological and relational processes has been shown to persist later in life (Briere & Jordan, 2009; Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008 for a review). Consequently, mothers' childhood experiences of victimisation could continue to have a detrimental impact on their cognitive ability in adulthood and could potentially have an influence on their ability to structure their descriptions of their children, as measured by the maternal scales. Studies investigating the associations between mothers' experiences of victimisation and their narratives' structural features have shown that mothers who experienced childhood abuse tended to experience difficulty talking about their early attachment experiences in a logical, coherent and understandable manner with an appropriate level of affect. Their narratives were often marked by incoherence, avoidance, confusion and inability to find words to describe their painful experiences (Stovall-McClough & Cloitre, 2006).

Domestic violence is another source of repeated victimisation that may affect mothers' cognitive functioning and emotional wellbeing (Radford & Hester, 2006). It includes a wide range of abusive behaviours, ranging from verbal threats and intimidation to rape and homicide (World Health Organization, 2005). In the UK, one in four women (one in three in the US and Canada) reported having suffered from domestic violence in adulthood with one in ten having experienced it in the last 12 months (ESRC Violence Research Programme, 1998; Hampton, Jenkins, & Vandergriff-Avery, 1999; Mirrlees-Black, 1999; Walby & Allen, 2004). Domestic violence is, therefore, a pervasive problem, affecting the lives of many women and their families.

Women who experienced domestic violence were found to be at higher risk for cognitive distortions, including denial, minimisation, rationalisation, self-blame and memory biases, attributed to their avoidance of their dangerous and unpredictable reality (Coker, Davis, & Arias,

2002; Heise and Garcia-Moreno 2002). This risk was greater for those who reported having experienced domestic violence throughout their lifetime than for those who suffered it only during adulthood (Roberts, Lawrence, Williams, & Raphael, 1998). These findings suggested that those who were exposed to more pervasive experiences of domestic violence suffered from increased cognitive distortions, as their functioning seemed to be continuously warped to help them deal with a continuously painful and volatile environment.

It is thus likely that experiences of victimisation, including childhood abuse and/or domestic violence in adulthood, could potentially have a negative influence on mothers' abilities to describe their children. Research has explored the associations between these cognitive distortions related to experiences of victimisation and mothers' narratives, as measured by AAI. Findings linked childhood experiences of victimisation with avoidant, fragmented and incoherent narratives, suggesting that these experiences had a detrimental effect on mothers' abilities to formulate coherent descriptions of their attachment experiences (Stovall-McClough & Cloitre, 2006). Therefore, mothers' experiences of victimisation could have an unfavourable influence on their ability to formulate coherent, consistent, reflective and informative descriptions of their children. However, these associations have not yet been investigated, and by examining whether mothers' experiences of victimisation influenced their narratives' structural features, this chapter aims to uniquely enrich current research.

4.1.4 Parenting behaviour

Research based on the attachment theory framework suggested that structural differences in adults' descriptions of their own childhood relationship experiences during interviews using the AAI were associated with differences in their parenting behaviour (Main et al., 1985). More specifically, mothers whose narratives were more open and informative tended to have warm, supportive and helpful parenting styles, whereas mothers who constructed more restricted or idealised narratives seemed less affectionate and more controlling towards their children (Adam

et al., 2004; Bosquet & Egeland, 2001; Crowell & Feldman, 1988). Additionally, mothers who formulated more preoccupied narratives were significantly more negative, anxious, inconsistent and intrusive in their parenting. Previous studies have not, however, explored the associations between mothers' descriptions of their children and their parenting styles. The present study seeks to add these findings to the existing body of knowledge, by examining whether mothers' parenting behaviour influenced their ratings on the maternal scales. My earlier findings have identified an association between the maternal scales and expressed emotion (EE: Brown & Rutter, 1966), a narrative measure widely used to indirectly assess parenting behaviour (see Chapter 3). It is therefore expected that mothers who are more capable of sustaining a coherent state of mind, reflecting upon conflicting emotions and incongruent attitudes and describing their children in an informative and realistic way with clarity and cohesion would have more positive parenting styles. Conversely, mothers who have more difficulty addressing conflicting attitudes and repairing cognitive distortions may have more confused, fragmented and skewed views of relationships. Their skewed functioning, as well as influencing their narrative construction, leading to increased levels of contradiction and incoherence, may also affect their parenting behaviour.

It is important to consider that one's ability to repair and compensate for cognitive distortions could vary between people and situations, as one's cognitive functioning is known to be influenced by individual characteristics and environment. Personality features, for example, have been recognised to influence parenting behaviour (Belsky, 1984). Specifically, personality features such as openness to experience, low neuroticism and extraversion were associated with more positive parenting. (Metsapelto & Pulkkinen, 2003). Openness to experience was also associated with restrictiveness, whilst low neuroticism was related to lower parental monitoring. Parents high in neuroticism tended to be less sensitive, stimulating and positive than those who were not (Clark, Kochanska, & Ready, 2000; Kendler, Sham, & MacLean, 1997; Metsapelto & Pulkkinen, 2005), whereas parents with high scores for extraversion and agreeableness demonstrated more positive and authoritative parenting styles (Clark et al., 2000), being more

sensitive and warm towards their children (Belsky, Crnic, & Woodworth, 1995). Although many have argued that extraversion is associated with positive parenting styles, there is still some dispute about this, as mothers who were high in either neuroticism or extraversion were found to use a more forceful disciplinary style (high in control and low in responsiveness) (Clark et al., 2000). These conflicting results suggest that the relationship between personality features and parenting behaviour is not simple, and it raises the possibility that the association between personality, parenting behaviour and narrative structure could be even more complex.

A mediation model is often used to identify the mechanism that explains an observed relationship between an independent variable and a dependent variable by the inclusion of a third explanatory variable, known as a mediator variable. Rather than hypothesising a direct causal relationship between the independent variable and the dependent variable, a mediation model hypothesises that the independent variable causes the mediator variable which, in turn, causes the dependent variable (MacKinnon, 2008). This chapter aims to ultimately investigate whether the relationship between mothers' personality and the maternal scales could be mediated by mothers' parenting behaviour.

Maternal difficulties, including history of mental health and previous experiences of victimisation, were also shown to have a negative impact on mothers´ parenting behaviour, influencing the emotional climate at home and the quality of their interaction with their children (Aber et al., 2000, for a review). For instance, depressed mothers of young children were found to express more criticism regarding their children than non-depressed mothers (Rogosch et al., 2004), and increased criticism has been associated with higher rates of parental negative affect, parenting stress and negative parenting styles (Baker, Heller, & Henker, 2000; Wamboldt, Connor, Wamboldt, Gavin, & Klinnert, 2000). Moreover, mothers' cognitive distortions related to their childhood experiences of victimisation and history of depression were identified as having a negative impact on mothers' parenting behaviour which, in turn, tended to transmit these cognitive biases to their children (Hadwin, et al., 2006; Murray & Cooper, 2003). In this study, I

aim to extend current research by exploring whether mothers' mental health history and experiences of victimisation would influence the structural features of mothers' descriptions of their children over parenting behaviour.

However, other factors, including increased levels of socio-economic disadvantage were predictive of change in personality type (i.e. going from a more socially skilled, positive and emotionally competent to a more impulsive and hyperactive personality), increased rates of psychiatric disorders (including substance abuse) and increased rates of child maltreatment and domestic violence (Bradley & Corwyn, 2002; Brown, Susser, Jandorf, & Bromet, 2000; Cawson, William, Brooker, & Kelly, 2000; Hart, Atkins, & Fegley, 2003, Walby & Allen, 2004). Research has also suggested that mothers who experience SES disadvantage are more authoritarian in their parenting with more controlling, restrictive, and disapproving attitudes than those who experience no deprivation (Evans, 2004; Feldman & Eidelman, 2009; Segawa, 2008). Based on this literature, it is relevant to consider mothers' experiences of SES disadvantage when testing the associations between mothers' parenting styles and their narratives' structural features. By examining these associations, this study aims to extend current research and augment the use of narrative measures as both a preventative and clinical tool.

If these potential associations between mothers' characteristics and their narratives' structural features are established, the maternal scales could be used to explore the extent to which individual differences in personality features, mental health history, experiences of victimisation and parenting behaviour may reflect on mothers' cognitive functioning, in relation to their ability to formulate descriptions of their children. The present study's results could be useful to mental health professionals working in both research and clinical settings, as they often depend on mothers' descriptions of their children to examine the quality of the parent-child relationship, conduct risk-assessments and evaluate children's difficulties, particularly among high-risk groups. A clearer understanding of these potential associations between mothers' individual

characteristics and their narratives' structural features could be useful to help clinicians formulate therapeutic interventions that may reduce the impact of mothers' characteristics may have on their ability to organise their perceptions, thoughts and feelings about their children. In addition, this development could also assist clinicians in designing new interventions aimed at improving mothers' psychosocial health and, consequently, their ability to parent their children, appreciate their children's disorders and help them cope with their children´s difficulties, and help them in planning strategies to retain mothers involved in therapeutic work and longitudinal research.

4.2 Aims and objectives

The research covered in this chapter has three main objectives. The first objective was to test whether mothers' characteristics influenced structural aspects of their narratives as measured in the Five Minute Speech Samples and derived using the maternal scales. Specifically, four distinct aspects of the mothers' general functioning were explored: 1) personality; 2) mental health history; 3) experiences of victimisation; and 4) parenting behaviour. The associations between the maternal scales and each characteristic were examined separately. With regard to personality features and based on existing literature, it was hypothesised that more conscientious, open, extroverted and agreeable mothers would formulate more coherent, consistent, reflective and informative narratives. Exceptions were anticipated, however, between extroversion and Relevance, considering that more adventurous, sociable and talkative mothers might formulate less consistent and pertinent narratives. Similarly, mothers with higher scores on neuroticism were expected to have less coherent, consistent, reflective and informative narratives. Mothers' mental health history and substance abuse were also anticipated to be associated with the Descriptive Reasoning and Relevance scales. My second hypothesis was that mothers with history of depression, psychosis spectrum disorders and/or substance abuse would formulate less coherent, consistent, reflective and detailed descriptions of their children. Mothers' early and

recent experiences of victimisation were also expected to affect the maternal scales. More specifically, mothers who endured childhood abuse or neglect and/or experiences of domestic violence in adulthood were hypothesised to be less able to construct coherent and reflective descriptions of their children. Finally, mothers with more negative, harsh, punitive, critical and hostile parenting styles were expected to construct less reflective, more inconsistent narratives with fewer detailed memories of their children.

My second objective was to test whether the associations between maternal scales and the mothers' characteristics were reflective of the entire sample and thus could be generalised to the population from which the sample was drawn or, conversely, varied according to SES deprivation.

The third objective was to examine whether the associations shown between the maternal scales and mothers' characteristics were being mediated by the mothers' parenting behaviour or whether these factors had a unique association with the maternal scales.

4.3 Method and measures

Participant mothers were members of the Environmental-Risk (E-Risk) Longitudinal Twin Study, which follows the development of 2,232 same-sex twins drawn from a larger 1994-1995 birth register of twins born in England and Wales (Trouton et al., 2002). Mothers were first interviewed during home visit assessments when their twin children were 5 years of age and again when their children were aged 7 (98% response rate, N= 2,191), 10 (96%, N= 2,143) and 12 (96%, N= 2,143). Participants of the present study were a subsample of 525 families randomly selected by the data manager of the E-Risk Study, which constituted 49.1% of the families assessed at phase 10. Detailed information about the sample construction is reported in Chapter 2. Considering previous findings that the maternal scales were stable and did not vary according to the twins' zygosity, an average score for each mother was derived from speech samples obtained for each twin. This maternal scale average score aimed to reflect the mother´s overall narrative style, less

likely to be affected by the characteristics of either one of her twins. For a detailed description of the maternal scales, please refer to Chapter 2, and for information on Socio-economic disadvantage (SES disadvantage) please refer to Chapter 3.

4.3.1 Mothers' personality

OCEAN personality inventory at phase 10 explores five dimensions of mothers' personality: conscientiousness, openness to experience, extroversion, neuroticism and agreeableness, based on a 44-item version of the Big Five Inventory (John & Srivastava, 1999). Immediately following the home visit, interviewers selected for each item which response options best described the mother´s personality: (0) = 'no/never', (1) = 'a little/sometimes' or (2) = 'yes/always'. Each dimension corresponds to the sum of their specific items. *Conscientiousness* measures goal-directed behaviour and control over impulses. It includes traits such as being organised, thorough, and methodical derived as the sum of five items, including 'Does parent do things quickly/carefully?', 'Does parent work until a thing is done?' and 'Is the parent a hard worker?', The internal consistency reliability was .87 (range: 0 to 10; M=7.87, SD=.11). *Openness to experience* relates to intellect, educational aptitude, creativity and interest in varied sensory and cognitive experiences. It measures traits, such as having wide interests, being imaginative and being insightful. Openness to experience was measured using five items, including: 'Is the parent original, has new ideas?', 'Does the parent have a good imagination?' and 'Is the parent creative?' The internal consistency reliability was .80 (range: 0 to 10; M = 5.44, S.D. =.14). *Extroversion* measures whether a person is outgoing or withdrawn in character. This scale encompasses specific personality traits such as talkative, energetic, and assertive. There were five items in this scale, including 'Does the parent talk a lot?', 'Does the parent keep thoughts to him/herself?' and 'Does the parent make things exciting?' The internal consistency reliability was .87 (range: 0 to 10; M = 7.13, S.D. =.11). *Neuroticism* measures emotional control and includes

traits like tense, moody and anxious. There were five items in this scale, including 'Is the parent relaxed, handles stress well?', 'Is the parent tense?' and 'Does the parent worry a lot?' The internal consistency reliability was .66 (range: 0 to 10; M = 2.47, S.D. =.11). *Agreeableness* measures traits like sympathetic, empathic, kind, and affectionate. Five items were used to derive this scale, including 'Does the parent forgive others easily?', 'Is the parent cold and distant with others?' and 'Is the parent kind and considerate?' The internal consistency reliability was .73 (range: 0 to 10; M = 8.35, S.D. =.09).

4.3.2 Mothers' mental health history

Mothers' history of depression at phase 10 was measured using items derived from the Diagnostic Interview Schedule to assess the presence of symptoms of depression in the last five years (DIS: Robins, Helzer, Croughan, Ratcliffe, 1981). The assessment took place when the children were aged 10. The DIS was designed to be administered as a semi-structured interview by research workers with minimum training in a single visit which led to a research diagnosis based on the Diagnostic and Statistical Manual of Mental Disorders criteria for a major depressive episode (DSM-IV: American Psychiatric Association, 1994). The first two questions (*"In the last five years has there ever been a period of at least two weeks when, nearly every day, you felt sad, depressed, empty or tearful most of the time?"* and *"In the last five years have you had a period of at least two weeks when, nearly every day, you lost all interest in things, or got no pleasure from things which would usually make you happy?"* were gate questions. If the parent responded positively to either of those questions, 24 follow-up questions further assessed the nature of the symptoms experienced during the period when their symptoms were the worst. Mothers received a score of (0) if they reported no signs indicative of depression and (1) if they reported having suffered from depressive symptoms. In this study sample, 131 (25%) mothers had had at least one episode of major depression in the last 5 years.

Psychosis Spectrum Disorder at phase 10 asks mothers about psychotic symptoms they may have experienced at any time in their life. The items were drawn from the DIS and inquired about characteristic symptoms of psychosis taken from the DSM-IV-based criteria for schizophrenia. Those criteria classified women classified as having a psychosis spectrum disorder if they experienced hallucinations, plus at least two of the following symptoms: delusions, disorganised speech, gross disorganisation or catatonic behaviour, negative symptoms (i.e. affective flattening, alogia or avolition) as well as evidence of social, occupational, or self-care dysfunction (Poulton et al, 2000). I did not aim to diagnose schizophrenia or other psychotic disorders but to identify women who reported psychotic-like experiences and beliefs bearing in mind compelling evidence that psychosis syndromes are more prevalent in the general population than diagnosed cases of psychotic disorders (Myin-Germeys et al, 2003). The interview ruled out symptoms with plausible explanations and symptoms occurring solely under the influence of alcohol or drugs. This measure comprised 40 items, including: *"Have you experienced, more than once, hearing things or hearing voices that other people cannot hear?", "Did you hear voices that were commenting on what you were doing* or thinking?" *and "Did you hear voices that were telling you what to do?"* Mothers received a score of (0) if they reported no symptoms and (1) if they described signs indicating a psychosis-spectrum disorder. In this subsample, 5.2% of mothers were categorised as having a psychosis-spectrum disorder.

Substance abuse at phase 10 was assessed with questions drawn from the Short Michigan Alcoholism Screening Test (SMAST; Pokorny, Miller & Kaplan, 1972) and the Drug Abuse Screening Test (DAST; Skinner, 1982) to assess problems related to drug misuse. This measure included 18 items, such as *"Have you used drugs (not alcohol) for other than medical reasons?", "Do you feel you have been a normal drinker/user?", "Do friends and relatives think you are a normal drinker/user?" and "Has a close relative ever complained about your drinking/drug use?"* Mothers rated each question as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). Mothers who reported four or more symptoms were considered to exhibit

substance abuse (Crews & Sher, 1992; Selzer, Vinokur, & van Rooijen, 1975). In this subsample, 48 mothers (9.1%) were considered to have substance abuse problems.

4.3.3 Mothers' experiences of victimisation

Mothers' early experiences of victimisation were assessed retrospectively using the short form of the Childhood Trauma Questionnaire (CTQ: Bernstein & Fink, 1998). The CTQ inquires about the history of five categories of childhood maltreatment: emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. A total of 28 items were presented to the mothers, including *"I didn't have enough to eat", "My parents were too drunk or high to take care of the family"* and *"I had to wear dirty clothes".* The validity of the original and brief versions of the CTQ has been previously demonstrated in clinical and community samples (Bernstein & Fink, 1998; Bernstein et al., 2003). The recommended classification scores were used to characterise the absence, or mild, moderate or severe experience, of maltreatment for each of the five categories and considered a specific category of maltreatment to be present if the participants endorsed a moderate or severe score. Subsequently a cumulative index of childhood maltreatment was derived by counting the number of categories in respect of which maltreatment was reported. Mothers were considered to have a history of childhood maltreatment if they were exposed at least one category of maltreatment. In this study sample, 141 women reported childhood maltreatment (27.5%).

Partner perpetration of violence in the last year was assessed at age 10 using 12 questions, nine of which were taken from the Conflict Tactics Scale (CTS, Form. R; Straus, 1990), plus three additional items describing other physically abusive behaviours (i.e. pushed/grabbed/shoved; slapped; shaken; thrown an object; kicked/bit/hit with fist; hit with something). Participants rated each item as being *not true* (0), or *very true* or *often true* (2). Another response option (1) was available for women who felt uncertain about their responses, but it was virtually unused. These

responses were thus aggregated with the latter option to ensure that all instances of violence were identified. Participants who reported any form of abusive behaviour were considered as having experienced domestic violence. Approximately one in four women (26.6% or N=139) met this criterion. The internal consistency reliability of the physical abuse scale was .98. Inter-partner agreement reliability for this measure is very high as measured in another population-based sample of young adults (latent correlation = .77; Moffitt et al., 1997). Moreover, this scale was a strong predictor of couples experiencing clinically significant levels of violence, involving injury and necessitating official agencies' intervention (Moffitt, Robins, & Caspi, 2001). Individuals with higher scores tended to experience domestic violence for a longer duration and reported more incidents per month than low scorers (Ehrensaft, Moffitt, & Caspi, 2004).

4.3.4 Mothers' parenting behaviour

Four aspects of parenting behaviour were assessed when the children were aged 10: parental monitoring, parenting difficulties, child neglect and negative parenting.

Parental monitoring assessed the mothers' levels of supervision of their children's activities when they were away from home. The scale included 10 items adapted from Margaret Kerr's monitoring and supervision questionnaire (Stattin & Kerr, 2000). Mothers rated each item as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). The questionnaire included items such as "Do you know which friends [child's name] hangs about with during his/her free time?", "Do you know where [child's name] goes during his/her free time?" and "Do you know what [child's name] spends his/her money on?" Range: 0 to 20, M=18.58, SD=2.52.

Parenting difficulties were documented using a questionnaire developed by the E-Risk team according to the experiences and difficulties reported by the mothers during the age 10 assessment. The questionnaire consisted of 25 items describing difficulties commonly faced by mothers that may influence their ability to effectively care for their children. This included items

such as *"Difficulties in finding good child minders", "Lack of knowledge about child development"* and *"Difficulties in getting help from teachers and schools".* Mothers were given the instrument as a face to face interview and were asked to rate each item as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). The internal consistency reliability was .81 (range 0 to 31, M=5.22, SD=5.25).

Child Neglect was assessed using six items included in the Research Worker's Impression Inventory. This inventory is a questionnaire filled in by the research workers designed to measure: the state and appearance of the home; child stimulation; impressions of parent and parent's personality; impressions of partner/father; the parenting of the children; child neglect; the children's personality; interactions between the twins; and emphasis on the twins' similarities or differences. It included items such as *"Do you think [child's name] is neglected?", "Is [child's name] well nourished?"* and *"Did [child's name] lack attention to personal hygiene".* The response options were *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). The internal consistency of this measure was .72 and the scores ranged from 0 to 12 (M=.98, SD=1.94).

Negative parenting was measured using seven items included in the Coder's Impression Inventory. It included items such as *"Parenting of [child's name] overly strict", "Parenting of [child's name] overly permissive or negligent" and "Parenting of [child's name] erratic, inconsistent or haphazard".* The internal consistency of this measure was .72 and the scores for ranged from 0 to 12 (M=.77, SD=1.57).

4.3.5 Statistical analyses

Statistical analyses were conducted in three stages. The first stage explored separately the associations between the new scales and each investigated maternal characteristic: 1) personality; 2) mental health history; 3) experiences of victimisation; and 4) parenting behaviour.

These associations were examined using linear regression analyses and comprised two models. Model 1 tested the association between mothers' personality features and the maternal scales, while Model 2 repeated this analysis controlling for SES disadvantage. The statistical analyses followed the same two step structure for each maternal characteristic. The second stage tested the moderating effect of SES disadvantage on the associations linking each mother´s characteristics and the maternal scales using linear regression models. Where a significant interaction effect was found, the association between the maternal characteristic and the maternal scale was further explored using Spearman correlations to estimate the strength of this relationship according to different levels of SES disadvantage. The third stage explored whether the associations found between the maternal scales and mothers' characteristics were being mediated by parenting behaviour. The test of mediation was uniquely conducted on the mothers' characteristics previously shown to be significantly associated with both the maternal scales and parenting behaviour using Spearman correlations. The mediating role of parenting behaviour in the associations linking mothers' characteristics and the maternal scales was then tested using regression analyses adding all four measures of parenting (i.e. parental monitoring, parental difficulties, child neglect and negative parenting) together. Additionally, all these statistical analyses were clustered by family identifying number to take into account the non-independent nature of the twin study design.

4.4 Results

4.4.1 Associations between the maternal scales and mothers' personality features

All the associations examined are reported in Table 4.1. Each personality dimension was positively associated with Descriptive Reasoning (Model 1, Table 4.1), indicating that the way mothers structured their narratives was associated with their personality features. These associations remained significant after controlling for the potentially confounding influence of SES

disadvantage (Model 2, Table 4.1). These results suggest that mothers demonstrating more dutiful, self-disciplined, intellectually curious and creative personalities, or showing more awareness of their feelings, tended to construct more coherent, relevant, reflective and informative narratives.

One exception was found in relation to neuroticism, as Descriptive Reasoning was negatively related to this personality feature in model 1, but this association became non-significant in model 2 when taking into account mothers' levels of SES disadvantage. This indicates that the link between neuroticism and the maternal narratives' structural features was partly explained by mothers' experience of socio-economic deprivation.

Three personality dimensions were positively associated with Relevance (Model 1, Table 4.1): conscientiousness, openness, and agreeableness. This suggests that mothers with more organised, creative and empathic personalities were more likely to formulate consistent and pertinent narratives. However, after controlling for mothers' levels of SES disadvantage in model 2, Relevance remained significantly associated only to conscientiousness. Thus, mothers' personality seemed to be associated with the way they formulated their descriptions of their children, as assessed by the Relevance scale, but the majority of these associations became non-significant after taking into account their experiences of SES disadvantage.

Table 4.1: Regression Analyses Testing the Association between Mothers' Personality and Maternal Scales

	Model 1					Model 2				
	Descriptive Reasoning		Relevance		R^2	Descriptive Reasoning		Relevance		R^2
	B	S.E.	*B*	S.E.		*B*	S.E.	*B*	S.E.	
Conscientiousness	.31***	.03	.03***	.01	.16	.20***	.03	.02*	.01	.25
Openness to experience	.28***	.02	.02**	.01	.21	.20***	.03	.01	.01	.28
Extroversion	.19***	.03	.01	.01	.06	.14***	.03	.01	.01	.06
Agreeableness	.30***	.04	.02*	.01	.01	.20***	.04	.01	.01	.11
Neuroticism	-.11***	.03	-.01	.01	.02	-.03	.03	-.01	.01	.06

Note. Model 2 was adjusted for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4.2 presents the interaction effects found between each personality dimension and SES disadvantage. Significant interactions with SES disadvantage were found for conscientiousness, openness to experience, extroversion and agreeableness in relation to the Descriptive Reasoning scale. These results suggest that the association found between Descriptive Reasoning and these personality features varies according to mothers' level of SES disadvantage. Further investigation of these four significant interactions was conducted using Spearman correlations to test the strength of the associations between mothers' personality features and Descriptive Reasoning according to different levels of socio-economic disadvantage. Results indicated that conscientiousness, openness to experience, extroversion and agreeableness were positively associated with Descriptive Reasoning when the participating mothers had experienced moderate (r_s *from .14 to .34,* $p_s < .01$) or high levels of SES disadvantage (r_s *from .31 to .42,* $p_s < .001$). No significant association was found between mothers' personality features and Descriptive Reasoning for those who had not experienced SES disadvantage (r_s from -.01 to .06, p_s = n.s.). The only exception was the relationship between Descriptive Reasoning and openness for mothers with no SES disadvantage (r =.12, $p < .05$), but consistently with earlier findings this association became stronger for those who had experienced moderate or higher levels of SES disadvantage (r_s *from .34 to .42,* $p_s < .001$). These findings suggest stronger patterns of associations between mothers' personality dimensions and Descriptive Reasoning in families confronted with higher levels of socio-economic disadvantage. This indicated that lower personality scores when combined with an increased level of socio-economic hardship had a strong negative impact on mothers´ ability to structure their narratives. No interaction effect was found with regards to the Relevance scale.

Table 4.2: Summary of the Interaction Effects between Mothers' Personality and SES Disadvantage on the Maternal Scales (N=518)

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	*B*	S.E.	R^2
Conscientiousness	.11*	.05	.24	.00	.01	.03
SES	-.67***	.13		-.09*	.04	
Conscientiousness X SES	.04*	.02		.01	.00	
Openness to experience	.15***	.03	.27	.00	.01	.02
SES	-.50***	.08		-.09*	.04	
Openness X SES	.03*	.01		.01	.00	
Extroversion	.07	.04	.22	.00	.01	.02
SES	-.77***	.13		-.07	.04	
Extroversion X SES	.04*	.02		.00	.00	
Agreeableness	.09	.06	.23	-.00	.02	.02
SES	-.93***	.18		-.12*	.05	
Agreeableness X SES	.06**	.02		.01	.01	
Neuroticism	.02	.04	.19	.00	.01	.01
SES	-.40***	.07		-.04	.02	
Neuroticism X SES	-.03	.02		-.00	.01	

Note. In all models SES stands for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

In summary, mothers' personality features were associated with how they structured their descriptions of their children, depending on their level of economic hardship in the case of Descriptive Reasoning.

4.4.2 Associations between the maternal scales and mothers' history of psychopathology

Table 4.3 below shows the associations between measures of mothers' mental health and the maternal scales. Descriptive Reasoning was negatively associated to substance abuse (Model 1), suggesting that mothers who suffered from substance abuse tended to have more difficulty constructing coherent, reflective and open narratives. However, this association did not remain significant once SES disadvantage was included in the model (Model 2).

Relevance was negatively associated to depression when controlling for SES disadvantage in model 2 (Table 4.3). This result could be a spurious effect or it may indicate that opposite findings were found according to distinct levels of SES disadvantage, as Relevance was not associated on its own to mothers' history of depression. These will be further investigated later in this chapter.

Table 4.3: Regression Analyses for Association between Mothers' Psychopathology and the Maternal Scales (N=525)

	Model 1					Model 2				
	Descriptive Reasoning		Relevance		R^2	Descriptive Reasoning		Relevance		R^2
	B	S.E.	*B*	S.E.		*B*	S.E.	*B*	S.E.	
Depression	-.00	.20	.-04	.06	.22	.24	.19	-.02*	.06	.36
Psychosis spectrum	-.58	.46	-.12	.13	.22	.16	.41	-.01	.13	.36
Substance abuse	-.72*	.35	-.01	.07	.22	-.22	.34	-.03	.01	.36

Note. Model 2 was adjusted for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error.*$p < .05$; **$p < .01$; ***$p < .001$.

Finally, in Table 4.4, results suggested that no interaction effect was found between mothers' history of depression in the last 5 years, psychosis spectrum, substance abuse and SES disadvantage in relation to both maternal scales. These findings seemed to show that the previous association found between Descriptive Reasoning's and substance abuse did not vary according to mothers' experience of socio-economic deprivation (Table 4.3, Model 1).

Since Relevance was not associated on its own to mothers' history of depression, Spearman correlations were conducted to further investigate whether the association found between these measures (in Table 4.3, Model 2), was consequence of opposite findings according to mothers' distinct levels of SES disadvantage. No significant association and no opposite results were found between depression in the last 5 years and Relevance for mothers who had experienced no, moderate or high levels of deprivation (r_s from -.02 to -.05, p_s = n.s.). These results seemed to indicate that the association found earlier between depression in the last 5 years and Relevance when controlling for SES could be a spurious effect.

In brief, the way mothers structured and formulated their descriptions of their children appeared to be related to mothers' personality traits and history of substance abuse. Mothers who were more extroverted, self-disciplined, compassionate and cooperative with fewer problems with alcohol and drug consumption tended to construct more coherent, reflective and informative narratives.

Table 4.4: Summary of the Interaction Effects between the Mothers' Psychopathology and SES Disadvantage on Maternal Scales

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	*B*	S.E.	R^2
Depression	.63	.38.	.19	-.11	.19	.02
SES	-.49***	.06		-.04*	.02	
Depression x SES	-.18	.21		.04	.08	
Psychosis spectrum	.72	.60	.18	.30	.19	.02
SES	-.48***	.05		-.03*	.01	
Psychosis spectrum x SES	-.20	.24		-.13	.07	
Substance abuse	-.50	.46	.19	-.05	.10	.02
SES	-.51***	.06		-.04*	.02	
Substance abuse x SES	.16	.15		.01	.03	

Note. In all models SES stands for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. ***p<0.001, *p<0.05.

4.4.3 Associations between the maternal scales and mothers' experiences of victimisation

Table 4.5 shows the associations between mothers' early experiences of victimisation, partner perpetration of violence in the last year and the maternal scales. No significant associations were observed between mothers' experiences of victimisation and their narratives' structural features. As there was no association between these variables, these analyses were not repeated controlling for SES disadvantage. Nevertheless, interaction effects were tested for. Results indicated that one interaction was found between mothers' early experience of victimisation and SES disadvantage in relation to the Descriptive Reasoning scale. These suggested that the way mothers structured their descriptions of their children were not directly influenced by their recent or earlier experiences of victimisation, but the association between these two measures varied according to mothers' experiences of deprivation. Further investigation was carried out to explore the strength of the association found between mothers' early experiences of victimisation and Descriptive Reasoning according to mothers' different levels of SES disadvantage using Spearman correlations. Results suggested one significant association between mothers' early experiences of victimisation and Descriptive Reasoning for those with no experience of SES disadvantage ($r = .12$, $p_s < 0.05$.). No significant association was found between mothers' early experience of victimisation and Descriptive Reasoning for those who had experienced moderate or high levels of SES disadvantage (r_s from -.00 to .03, p_s = n.s.).

Results indicated that mothers who reported not to have suffered from early experiences of victimisation and socio-economic deprivation tended to formulate more coherent, reflective and informative descriptions of their children. The new scales' ratings thus seemed to be summarizing aspects of mothers' narrative structure which were influenced by associations found between their level of deprivation and early experiences of childhood abuse and neglect.

Table 4.5: Regression Analyses for Association between Mothers' Experiences of Victimisation and the Maternal Scales (N=511)

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	*B*	S.E.	R^2
Early experiences of victimisation	-.21	.22	.00	-.02	.05	.00
Partner perpetration of violence	-.32	.20	.00	-.03	.06	.00

Note. *B*=*Coefficient* and *S.E.* = Standard Error.

Table 4.6: Summary of the Interaction Effects between the Mothers' Experiences of Victimisation and SES Disadvantage on Maternal Scales

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	*B*	S.E.	R^2
Early experiences of victimisation	.91**	.35	.19	-.06	.10	.02
SES	-.46***	.04		-.04***	.01	
Early experiences of victimisation x SES	-.39**	.15		.03	.04	
Partner perpetration of violence	.06	.08	.19	-.04	.02	.01
SES	-.51***	.03		-.04***	.01	
Partner perpetration of violence x SES	-.01	.03		.02	.01	

Note. In all models SES stands for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. ***p<0.001, ** p<0.01

4.4.4 Associations between the maternal scales and mothers' parenting behaviour

Parental monitoring was positively associated with Descriptive Reasoning (Model 1, Table 4.6), indicating that mothers who were more aware of their children's behaviour and whereabouts tended to formulate more coherent, reflective and informative descriptions of their children. Parenting difficulties were negatively related to Descriptive Reasoning and Relevance (Model 1, Table 4.6), suggesting that mothers who had experienced more difficulties in caring for their children formulated more incoherent, inconsistent and less informative narratives. These associations, however, became non-significant after controlling for the potentially confounding influence of SES disadvantage (Model 2, Table 4.7). These results suggest that the association found between mothers' monitoring behaviour and parental difficulties using the maternal scales could be partly explained by mothers' levels of SES disadvantage. Child neglect and negative parenting were negatively associated with both maternal scales in model 1, and these associations remained after the influence of SES disadvantage was controlled for in Model 2 (Table 4.7). These results indicate that child neglect and negative parenting influenced the maternal scales' ratings even when mothers' different levels of SES disadvantage were accounted for. This suggests that mothers with more positive parenting styles tend to construct more coherent, relevant, reflective and open narratives.

Table 4.7: Regression Analyses for Association between Mothers' Parenting Behaviour and the Maternal Scales (N=525)

	Model 1					Model 2				
	Descriptive Reasoning		Relevance		R^2	Descriptive Reasoning		Relevance		R^2
	B	S.E.	B	S.E.		B	S.E	B	S.E.	
Parental Monitoring*[1]	.15**	.06	.01	.01	.24	.07	.04	.00	.01	.36
Parenting Difficulties	-.06***	.02	-.01*	.01	.23	-.01	.02	-.01	.01	.36
Child Neglect	-.44***	.06	-.06**	.02	.32	-.29***	.06	-.05*	.02	.39
Negative Parenting	-.38***	.08	-.05*	.02	.27	-.25***	.07	-.05*	.02	.38

Note. Model 2 controlled for SES Disadvantage. *B* = Coefficient and *S.E.* = Standard Error; *[1] 1 case missing (N=524). * $p < .05$; ** $p < .01$; *** $p < .001$.

Two significant interaction effects were found between mothers' parenting behaviour and SES disadvantage (Table 4.8). The first interaction identified differential strength in the association linking parental monitoring and Descriptive Reasoning, according to distinct levels of SES disadvantage. Spearman correlations were carried out to investigate these interaction effects further. Results indicated that parental monitoring was positively associated with Descriptive Reasoning when the mothers had experienced either no or high SES disadvantage (r_s *from .16 to.19,* p_s *< .01).* No association was found between Descriptive Reasoning and mothers' monitoring behaviour for those who had experienced moderate levels of SES disadvantage (*r =.05, p > .05*).

The second interaction revealed that the association between negative parenting and Descriptive Reasoning varied as a function of SES disadvantage. Further analysis using Spearman correlations showed that no association was demonstrated between negative parenting and Descriptive Reasoning for those who had experienced either moderate or no SES disadvantage (r_s *from -.07 to -.08,* p_s *> .05).* Negative Parenting was only negatively associated to Descriptive Reasoning for those who had experienced high SES disadvantage (*r=-.33, p<.001*). Overall, mothers, who had more self-disciplined, extroverted and cooperative personalities, fewer problems with substance abuse and more positive parenting styles, tended to construct more coherent, reflective, relevant and open narratives.

Table 4.8: Summary of the Interaction Effects between Maternal Scales, SES Disadvantage on Mothers' Parenting Behaviour

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	B	S.E.	R^2
Parental Monitoring*[1]	.01	.04	.20	-.01	.01	.02
SES	-1.23***	.36		-.14	.11	
Parental Monitoring*[1]x SES	.04*	.02		.01	.01	
Parenting Difficulties	-.00	.02	.19	-.00	.01	.03
SES	-.45***	.08		-.02	.02	
Parenting Difficulties x SES	-.01	.01		-.00	.00	
Child Neglect	-.14	.10	.25	-.02	.03	.05
SES	-.31***	.06		-.01	.02	
Child Neglect x SES	-.05	.03		-.01	.01	
Negative Parenting	.14	.11	.23	-.00	.05	.03
SES	-.39***	.06		-.02	.01	
Negative Parenting x SES	-.17**	.06		-.02	.02	

Note. In all models SES stands for SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error; N=525, *[1] 1 case missing; * $p < .05$; ** $p < .01$; *** $p < .001$.

To examine whether mothers' personality features and mental health history were uniquely associated with the maternal scales rather than being mediated by their parenting behaviour, further analyses were required. I first explored whether these three different groups of variables were significantly associated, as this is a pre-requisite for testing a meditational model.

Mothers' mental health and personality measures were significantly associated with parenting behaviour (r_s *from -.39 to .27,* $p_s < .001$*),* except with extroversion for parenting difficulties and neuroticism for negative parenting (r_s *from .05 to .06,* $p_s > .05$*).* Additionally, mothers' substance abuse was only associated with conscientiousness (*r -.14, p < .01)*. Based on these findings, the meditational models were only conducted between the mothers' personality, parenting measures and the maternal scales.

Results confirmed that conscientiousness, openness to experience, extroversion and agreeableness remained positively associated with Descriptive Reasoning, after controlling for several measures of parenting behaviour (Table 4.9). These indicated that these four mothers' personality features influenced the way they structured their narratives over and above their parenting behaviour. Thus, mothers' personality shaped the way mothers described their children over and above the way they related to their children.

However, the relationship between neuroticism and Descriptive Reasoning became non-significant, as was Relevance's association to conscientiousness and openness, after controlling for parenting behaviour. These results suggested that the link between neuroticism and Descriptive Reasoning, as the association between conscientiousness and openness and Relevance, were partly explained by mothers' parenting styles.

These findings suggest that mothers' personality features, in particular, conscientiousness, openness, extroversion and agreeableness, exert a unique influence on the Descriptive Reasoning aspect of their narratives that is not explained by their parenting styles.

Table 4.9: Regression Analyses for Association between Mothers' Personality, Parenting and the Maternal Scales Controlling for Parenting Behaviour (N=518)

	Descriptive Reasoning			Relevance		
	B	S.E.	R^2	B	S.E	R^2
Conscientiousness	.21***	.04	.23	.02	.01	.05
Parental Monitoring	.06	.04		-.01	.01	
Parenting Difficulties	.00	.02		-.01	.01	
Child Neglect	-.31***	.07		-.04	.02	
Negative Parenting	.02	.09		-.01	.02	
Openness	.22***	.03	.28	.01	.01	.05
Parental Monitoring	.05	.04		-.01	.01	
Parenting Difficulties	-.01	.02		-.01	.01	
Child Neglect	-.30***	.07		-.04	.02	
Negative Parenting	-.01	.09		-.01	.02	
Extroversion	.15***	.03	.21	.01	.01	.05
Parental Monitoring	.06	.05		-.01	.01	
Parenting Difficulties	-.01	.02		-.01	.01	
Child Neglect	-.37***	.07		-.04	.02	
Negative Parenting	-.04	.09		-.01	.03	
Agreeableness	.18***	.05	.20	.00	.01	.05
Parental Monitoring	.08	.05		-.00	.01	
Parenting Difficulties	-.00	.02		-.01	.01	
Child Neglect	-.38	.08		-.04	.02	
Negative Parenting	.05	.09		-.01	.03	
Neuroticism	-.03	.04	.18	-.00	.01	.06
Parental Monitoring	.08	.05		-.01	.01	
Parenting Difficulties	-.00	.02		-.01	.01	
Child Neglect	-.40***	.07		-.04*	.02	
Negative Parenting	-.02	.10		-.01	.02	

Note. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

4.5 Discussion

This chapter extends the findings of narrative research by examining whether individual dimensions of mothers' functioning (i.e. their personality features, mental health history, experiences of victimisation and parenting behaviour) influenced the structural features of their narratives, as assessed by the newly derived scales. Overall, I found that the way mothers formulate and structure their descriptions of their children is related to three main dimensions: personality features, mental health history and parenting behaviour. More specifically, my results suggest that mothers who have a more conscientious, self-disciplined, goal-orientated and focussed personality or who exhibit less signs of neuroticism, tend to construct more coherent, reflective and informative narratives. These personality features seem to be associated with a decreased tendency towards cognitive distortions in the participating mothers, as those who are more capable of maintaining a coherent and calm state of mind, whilst reflecting upon conflicting emotions and incongruent behaviour, are also more able to describe their children with clarity and cohesion and establish more positive relationships.

Moreover, mothers who are more open to new experiences, creative, aware of their feelings, considerate and helpful to others, rather than being suspicious and antagonistic, are more likely to construct relevant and consistent narratives. These results align with previous literature suggesting that individuals who demonstrate high levels of neuroticism are more likely to have reduced cognitive ability when processing information during verbal tasks that require complex attention (Baddeley, 1996; Eysenck, 1992a, 1992b; Hadwin et al., 1997). These results are also consistent with earlier findings that specific personality features, including mothers' abilities to regulate their own attention and behaviour, as is characteristic of more conscientious mothers, could protect them against information-processing biases (Derryberry & Reed, 2002; Lonigan, et al., 2004; Muris et al., 2007).

Descriptive Reasoning remained associated with conscientiousness, openness, extroversion and

agreeableness, whilst Relevance only kept its association to conscientiousness once controlling for the confounding effect of SES disadvantage. Results suggest that SES disadvantage moderated Descriptive Reasoning´s associations with conscientiousness, openness to experience, extroversion and agreeableness. The associations between mothers' personality features and their maternal scales' ratings appeared to become stronger for those mothers who experienced increased levels of SES disadvantage. This is consistent with previous research suggesting that different personality features are associated with different responses to social situations and economic circumstances, with important consequences for life outcomes, including economic attainment and socio-economic status (Eaton & Funder, 2003; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). It is therefore expected that the associations between mothers' personality and narrative ratings varied somewhat according to their experience of SES disadvantage.

The present study augments pre-existing knowledge in this area and its unique contribution could have useful implications for research methods as well as clinical practice. This is because with this improved understanding of the potential negative influence mothers´ personality features and SES disadvantage could have on their descriptions of their children; both clinicians and researchers will be more sensitive when interviewing mothers and better equipped to make assessments or analyse data derived from mothers' reports of their children, particularly among high-risk groups.

Of all the mental health history and experiences of victimisation measures, substance abuse was the only one which seemed to influence maternal narratives' structural features. These findings are somewhat unexpected, as previous studies have indicated that adults suffering from depression and experiences of victimisation are more likely to have difficulties recalling specific memories and tend to overgeneralise their descriptions (Goddard et al., 1996; Kuyken & Brewin, 1995; Kuyken & Dalgleish, 1995; McNally et al., 1995; Williams et al, 2007). However, this disparity could be partly explained by two methodological differences. First, in the present study, I

assessed a community sample with only a small number of participating mothers who had experienced childhood abuse/neglect or domestic violence, whereas previous reports were based on clinical samples. Second, this study investigated structural features of mothers' descriptions of their children, rather than descriptions of their mental health problems or experiences of victimisation. Research has suggested that mothers may be able to protect their reflective ability in relation to a specific relationship (for example with their children) from the impingement stressful experiences have upon their more general reflective capacity (Fonagy & Target, 2006). It is thus possible that mothers could preserve some of their reflective ability, for example, in relation to their children, by compartmentalising that part of their functioning. Therefore, the reduction in mothers' reflective ability and the cognitive distortions (i.e. denial, minimisation, rationalisation, self-blame and memory biases) usually associated with their attempts to avoid these painful memories (Coker et al. 2002; Heise & Garcia-Moreno 2002) may not apply in the context of the mother–child relationship. This hypothesis may partly explain why mothers' experiences of victimisation, for example, did not have an effect on the structural features of their descriptions of their children.

Conversely, I found that mothers' history of substance abuse could influence their narratives' structural features, as mothers who had experienced less substance abuse tended to formulate more coherent, reflective and open narratives. This supported earlier findings relating repeated drug abuse with reduced cognitive abilities, including response inhibition, planning and memory, even in the absence of the drugs (Bechara et al., 2001; Grant et al., 2000). Substance abuse thus seemed to be associated with more distorted cognitive functioning in the participating mothers, leading to increased levels of contradiction, confusion and incoherence. These distortions seemed to affect not just their narrative construction, but also their parenting behaviour. Consequently, mothers who repeatedly abused drugs and/or alcohol seemed to have more difficulty repairing cognitive distortions and addressing conflicting attitudes, leading to more chaotic, fragmented and skewed relationships.

Mothers who were depressed also showed an increased tendency to formulate less pertinent and consistent narratives after controlling for SES disadvantage. This may indicate that mothers with recent history of depression had more trouble focusing on the task, formulating more inconsistent descriptions of their children. This result was rather unexpected, as Relevance on its own was not associated to mothers' history of depression. This could be a spurious effect or it could indicate that opposite results may have been found according to distinct levels of SES disadvantage. However, when testing whether Relevance's association with mothers' recent history of depression varied according to their experience of SES disadvantage, no interaction effect was found, suggesting that the previous result was a spurious effect. These findings suggest that mothers' recent experiences of depression did not influence their ability to focus on the task and formulate pertinent descriptions of their children. This was consistent with previous results indicating that mothers may be able to compartmentalise part of their functioning to protect a specific relationship (i.e. with their children) from the negative impact difficult experiences, including mental health problems, could have upon their more general cognitive ability. This could represent a unique contribution of the present study to current knowledge, with useful implications for clinicians when designing future interventions aimed at improving mentally ill and victimised mothers' psychosocial health. This is because mothers' reflective abilities, which were associated with their way of thinking about and dealing with their children, seemed to have been split from their more impaired general functioning and, consequently, partly protected. Clinicians could make use of this better preserved part of their functioning to help mothers recover more quickly, by coping better with their own difficulties and engaging further in therapeutic work.

Mothers´ parenting behaviour was also found to influence the maternal scales' ratings. This is consistent with previous attachment theory research, indicating that the way parents related to their children was associated with the structural features of their descriptions of their own attachment experiences (Baradon & Steele, 2008; Bus & Van IJzendoorn, 1992; Fonagy et al., 1991; Grossmann et al., 2008; Main et al., 1985; Main & Goldwyn, 1992; Steele et al., 2002;

Steele, Hodges, Kaniuk, Steele, Hillman & Asquith, 2008). More specifically, mothers who formulated more coherent and informative narratives of their own experiences of being parented were more likely to have warm, supportive and helpful parenting styles, while those who constructed more impoverished or idealised narratives tended to be less affectionate and more controlling (Adam et al., 2004; Crowell & Feldman, 1988; Bosquet & Egeland, 2001). Consistently, in the present study, mothers' less negative parenting styles seemed to be related to more coherent, reflective, consistent and informative narratives, as had been suggested by previous findings from attachment research (Adam et al., 2004; Crowell & Feldman, 1988; Bosquet & Egeland, 2001). This study demonstrates that the structural aspects of mothers' descriptions of their children, as measured by the maternal scales, were related to their parenting behaviour and these findings were consistent with those derived from AAI.

The associations between child neglect and negative parenting behaviour and Descriptive Reasoning remained after controlling for different levels of SES disadvantage. This suggested that mothers who were more neglectful and negative towards their children tended to construct less coherent, reflective and informative narratives, after taking into consideration their experience of socio-economic deprivation. Research had previously shown that mothers who experienced high SES disadvantage were more authoritarian, controlling, restrictive and disapproving towards their children than those who experienced no deprivation (Evans, 2004; Feldman & Eidelman, 2009; Segawa, 2008). The present study extends these findings, by showing that the associations found between mothers´ parenting behaviour and their narratives' structural features could not be fully explained by the influence exerted by SES disadvantage on either parenting style or the maternal scales' ratings (see Chapter 3).

Overall, my results suggested that mothers' personality features seemed to influence maternal narratives' structural aspects over and above the way mothers related to and interacted with their children, as assessed by different measures of parenting behaviour, including parental monitoring, parenting difficulties, child neglect and negative parenting. These findings indicate

that unlike other pre-existing narrative measures, including EE and AAI, the new maternal scales extract maternal narratives' structural features, which are more associated with mothers´ own personality features rather than their parenting behaviour. Accordingly, the present study makes an original contribution to research methods by identifying that the ways mothers formulate and structure their descriptions of their children are more influenced by their own personality features than their parent ability. The maternal scales' findings thus provide additional information to that captured by previous narrative measures, expanding the pre-existing body of narrative research. My findings were, however, restricted by a few methodological limitations. First, because mothers were informants on both their characteristics and their narratives, it is likely that shared method variance could have influenced the results. Although an attempt was made to minimise this possibility by using multiple measurement modalities, such as maternal speech sample and home visitor ratings, shared method inflated variance is still a possibility. Caution must also be had in relation to generalising the findings to fathers. Longitudinal research, using both reported and observed data on both mothers and fathers, would be useful in the future, to examine whether differences in mothers' versus fathers' narratives mirror actual differences in their personalities, mental health history, experiences of victimisation and parenting behaviour. Second, my findings did not explore the directionality of these associations and, accordingly, no further inference could be made on what are the causes and effects of the investigated relationships. This limitation could be addressed by future research. Third, as the maternal narratives utilised in this study derived from mothers of twins, these findings may not apply to mothers' descriptions of singletons. Once again future research using mothers' descriptions of both singletons and twin children could be useful to address these concerns. Finally, because I did not measure other types of narratives, including mothers' descriptions of their mental health history or experiences of victimisation, I was unable to further investigate whether there were specific cognitive distortions more pervasive to other areas of their general functioning, which did not became apparent when they were asked to think about and describe their children. Despite these

shortcomings, this study is a useful test of the association between mothers' characteristics and the new maternal scales. Using a large population sample and four different groups of measures of mothers' characteristics and drawing on data from multiple informants, with analysis controlled for socio-demographic confounders and parenting measures, it establishes the relevance of the new scales and their utility in broadening the ambit of research in relation to maternal narratives. This study's results have so far indicated that the maternal scales, by focussing on the structural features of mothers' descriptions of their children, were a valid and original measure, useful in exploring whether mothers' characteristics could influence their narrative construction. These results also indicate that in order to further assist mental health professionals working with children and families, it would be relevant to explore in the future whether mothers' inabilities to formulate clear and consistent descriptions of their children, which were associated with their personality features, could also influence mothers' abilities to appreciate their children's disorders and, consequently, whether this potential association could interfere with mothers' capacities to accept their children´s difficulties, limit their abilities to help their children overcome these problems and be applied to help them engage in therapeutic work.

Having established the validity of the new maternal scales and examined whether individual dimensions of mothers' functioning influenced their narratives' structural features, I then went on to investigate the extent to which the structural features of mothers´ narratives were associated with their children's measures of externalising and internalising behaviour.

Chapter 5: Maternal scales' associations with children's behaviour problems

After documenting the validity and reliability of the maternal scales and examining their associations with the mothers' personality characteristics, this chapter aims to investigate whether the maternal scales were associated with children's externalizing and internalizing behaviour and parenting styles. This examination was carried out in three stages. First, I explored the associations between the maternal scales and children's externalizing and internalizing behaviour. Second, I tested the associations between the maternal scales and measures of parenting, such as maternal warmth and negativity, parental monitoring, parenting difficulties, negative parenting, child neglect, adult involvement and parental supervision. Third, I investigated whether the associations observed between the maternal scales and children's externalizing and internalizing behaviour were mediated by parenting measures.

5.1 Introduction

According to the Office for National Statistics (2004), one in ten children and young people in the UK from 5 to 16 years of age had a clinically diagnosed mental health disorder, as defined by the ICD-10 (World Health Organization, 1992). Externalizing and internalizing behaviour are common in western countries, affecting up to 1.1 million children in the UK (8% with externalizing and 4% internalizing behaviour). Externalizing behaviour refer to a group of actions manifested in children's outward behaviour that have a negative impact on the external environment such as disruptive, hyperactive, aggressive and destructive behaviours (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 2001). Internalizing behaviour reflect mainly aspects of the children's internal emotional state, including withdrawn, anxious, inhibited, fearful and depressed behaviours (Campbell et al., 2000; Eisenberg et al., 2001). Children's behaviour problems are a matter of public health; as 80% of children with behaviour problems at age of five tend to develop more

severe forms of behavioural problems, such as delinquency, truancy and physical violence (Office for National Statistics, 2000; Scott, Knapp, Henderson, & Maughan, 2001). Children's behaviour problems are also costly. For example, one pupil in every 1,000 is permanently excluded from school every year and at least 70,000 children play truant on any given day in the UK. According to New Philanthropy Capital's report (Brookes, Goodall, & Heady, 2007), the total cost of a child excluded from school to the government can totalize up to £63,851, based on findings suggesting that excluded children tend to get worse grades at school and in adulthood they are more likely to earn less, claim more social security benefits, have poorer physical health, rely on the National Health System, and are up to twice as likely to commit crime.

In addition to the financial burden on the society, externalizing and internalizing behaviour may have detrimental effects on families and the community. For example, children's externalizing and internalizing behaviour are associated with learning difficulties and poor school attendance in childhood; peer victimisation, delinquency, school dropout and substance abuse in adolescence; and crime, violence, unemployment, substance abuse and psychiatric disorders in adulthood (Bor, McGee, & Fagan, 2004; Campbell, Harris, & Lee, 1995; Colman et al., 2009; Keiley, Bates, Dodge & Pettit, 2000; Laukkanen, Shemeikka, Notkola, Koivumaa-Honkanen, & Nissinen, 2002; Moffitt, 1993; Wittchen, Kessler, Pfister, & Lieb, 2000).

Research has identified some familial risk factors that are associated to both externalizing and internalizing behaviour in children (Green, McGinnity, Meltzer, Ford, & Goodman, 2005). Several familial risk factors have been recurrently related to children's externalizing behaviour, such as young and low-educated parents, marital problems, low social support, poor parenting and harsh discipline (Bayer et al., 2006; McCarty et al., 2005; van Zeijl et al., 2006; Weiss, Dodge, Bates & Pettit, 1992). In association with children's internalizing behaviour, other familial risk factors have been reported, including parent illness/death, maternal anxiety and overprotective parenting (Bayer et al., 2006; Bosquet & Egeland, 2006; McCarty et al., 2005).

Researchers have observed the central role of mothers in family life and have shown that children of young, single, poor, uneducated (Brenner & Fox, 1998), depressed (Chilcoat &

Breslau, 1997; Fergusson, Lynskey, & Horwood, 1993; Kinard, 1995; Pike et al., 2006) and rejecting mothers (Raine, Brennan, & Mednick, 1994) are more likely to have behaviour problems. They have reported that mothers' parenting behaviour, specifically mothers' detrimental attitudes towards their children, such as being controlling, harsh, hostile, rejecting and inconsistent towards their children's needs were all negatively associated with their children's behaviour (Cicchetti & Toth, 1995; Hammen & Rudolph, 1996; Rubin, Bukowski, & Parker, 1998; Weiss & Schwarz, 1996). Longitudinal research has also shown that positive and effective parenting by the mother was associated with reduced conduct problems in at risk children (Webster-Stratton & Hammond, 1997). Findings suggest that interventions targeting parenting skills, such as to increase parental monitoring and to diminish neglectful, harsh and permissive parenting behaviour, can help diminish aggressive and antisocial behaviour in children, by breaking reciprocally coercive chains of parent-child interactions and reinforcing consistently sociable behaviour (Patterson & Fisher, 2002; Forgatch & Patterson, 1989). Mothers' characteristics associated to their parenting behaviours, including depression, stress, satisfaction and efficacy, constitute possible effective templates for intervention programs aiming to reduce the incidence of behavioural problems in referred children (Hudson, Doyle, & Gar, 2009; Murray et al., 2008; de Wilde & Rapee 2008; Webster-Stratton & Hammond, 1997). Better understanding the role played by mothers in the onset and maintenance of children's behaviour problems could provide valuable information to design more effective intervention programs aiming at either preventing or reducing behavioural maladjustment. The present study aims to extent the current state of knowledge by specifically exploring the associations between the structural features of maternal narratives and children's externalizing and internalizing behaviour.

Researchers have frequently used measures of mothers' narratives to examine the potential impact of the quality of their parenting on children's behaviour problems. Among these measures, the expressed emotion (EE: Brown & Rutter, 1966) coding system derived from the FMSS is one of the most widely used (Magaña et al., 1986). The EE is based on the assumption that the emotional content of parents' descriptions of their children mirrors the quality of their

relationship and their interactions at home (Baker et al., 2000; Bolton et al., 2003; Hastings & Lloyd, 2007; McCarty & Weisz, 2002; Nelson et al., 2003; Peris & Baker, 2000). Findings have suggested that high levels of parental criticism and hostility, as measured by EE, were related to parenting behaviour and children's externalizing and internalizing behaviour (Butzlaff & Hooley, 1998; Daley et al., 2003; Hibbs, et al., 1991; Hirshfeld, et al., 1997; McCarty & Weisz, 2002; Peris & Baker, 2000; Reiss, et al., 1995; Scott & Campbell, 2000; Stubbe, et al., 1993; Vostanis, Nicholls, & Harrington, 1994). Therefore, the associations reported between EE and the children behavioural problems may be explained by parenting styles, since EE has been described as a good indicator of parenting behaviour (McCarty et al., 2004). EE, however, has some important limitations, including that it does not summarize any structural features of the maternal narratives. Additionally, there is no other validated instrument aimed at measuring the structural features of narratives that could be applied to the same speech samples derived from the FMSS and used to extract EE. Thus, new validated measures of structural features of maternal narratives could provide valuable additional information on the crucial role mothers play in the aetiology of children's behaviour problems.

Another line of research, based on the attachment theory framework, examines the coherence level of parents' descriptions of their own experiences of being parented using the AAI (Main et al., 1985). It is most commonly used to predict parenting behaviour (Baradon & Steele, 2008; Bus & Van IJzendoorn, 1992; Crowell & Feldman, 1988; Fonagy, Steele, & Steele, 1991; Grossmann, Fremmer-Bombik, Heinicke, & Levine, 2008; Main et al., 1985; Main & Goldwyn, 1992; Grossman, et al., 1988; Steele et al., 2008; Steele et al., 2002; Van IJzendoorn et al., 1991). Findings suggest that the way parents structure their narratives, by sustaining a good match between memories and evaluations concerning attachment, by providing a succinct but yet complete description of attachment relationships and by describing relevant details with clarity and orderliness, influence how they relate to their children (Main et al., 1985). Mothers with open and informative narratives were more likely to be warm, supportive and helpful to their children; mothers with restricted or idealised narratives were less affectionate and more controlling,

whilst preoccupied mothers were more inconsistent and intrusive in their parenting (Adam et al., 2004; Crowell & Feldman, 1988; Bosquet & Egeland, 2001). These structural features seemed to reflect important differences in the organisation of parents' expectations and perceptions, which were shown to be associated with parenting and children's behaviour (Bus & Van IJzendoorn, 1992; Fonagy et al., 1991; Grossmann et al., 2008; Main et al., 1985; Main & Goldwyn, 1992; Steele et al., 2008; Stams, Juffer, & Van IJzendoorn, 2002). Results also suggest that adult attachment classifications, measured in the AAI, were related to maternal emotional well-being and parenting behaviour. Mothers, whose narratives were classified as dismissing, reported significantly lower levels of maternal warmth, whilst mothers with preoccupied narratives reported significantly higher levels of negativity, anxiety and displayed higher rates of angry/intrusive parenting behaviour. Dismissing narratives were significantly associated with lower maternal warmth and responsiveness levels only among depressive mothers. Maternal emotional well-being did, however, moderate the associations between adult attachment classifications and parenting behaviour (Adam et al., 2004).

Findings from these two independent lines of research have suggested that maternal narratives were a useful tool when investigating the way mothers relate to and parent their children. However, no research has yet integrated the different measures used by these two distinct lines to explore the structural features of mothers' descriptions of their children derived from short speech samples and their associations to children's behaviour problems and parenting behaviour. Thus, a new empirically validated measure that assesses structural features of maternal narrative by minimally trained health professionals or researchers, simplifying the data collection and coding processes for the AAI which are very lengthy and costly, are needed. This development would probably increase the use of maternal narratives in clinical practices and research institutions. Thus, a set of valid new scales that could extract structural features of maternal narratives, based on short speech samples, integrating specificities of both EE and AAI, would represent an important contribution to research methods. This study will explore whether

the structural features of mothers' narratives, as assessed by the maternal scales, were associated with children's behaviour.

5.2 Aims and Objectives

This chapter aimed to further investigate the construct validity of the maternal scales by examining their associations with children's externalizing and internalizing behaviour. Our objectives were threefold: 1) explore the association between the maternal scales and children's externalizing and internalizing behaviour, 2) describe the associations between the maternal scales and eight previously established parenting measures such as maternal warmth and negativity, derived from the EE, Parental Monitoring, Parenting Difficulties, Negative Parenting, Child Neglect, Adult Involvement and Parental Supervision and 3) test whether the maternal scales uniquely contribute to predict the children's behaviour problems over and above these parenting measures.

First, I tested whether more convoluted and distorted maternal narratives were associated with greater concurrent and future externalizing and internalizing behaviour in the children. To achieve this objective and take advantage of the longitudinal nature of the data, I investigated whether the associations found between the maternal scales and children's behaviour problems at ages 10 and 12 would remain after controlling for children's behaviour problems measured at ages 5 and 10. These analyses aimed to test the directionality of the associations between the maternal scales and children's behaviour problems. If these associations remained significant after controlling for children's previous behaviour problems, these results would suggest that the children's behaviour at age 5 and 10 did not explain the associations between the maternal scales and children's behaviour problems at ages 10 and 12 and that more convoluted and distorted maternal narratives were evoking higher rates of children's externalizing and internalizing behaviour.

Second, to verify that these findings were not being influenced by social demographic factors and could be generalised to the whole sample, I tested for interactions effects between the maternal scales, SES disadvantage and children's gender in relation to children's externalizing and internalizing behaviour at age 10.

Third, I examined the association between the maternal scales and eight well-validated parenting measures, collected when the children were ages 10 and 12, and tested whether the parenting measures mediated the association between the maternal scales and children's behaviour problems. I investigated whether maternal warmth and negativity mediated the associations between Descriptive Reasoning, Relevance and children's behaviour problems at age 10, as previous findings (reported in Chapter 3), suggested that the maternal scales were associated with these measures. Therefore, to make sure that these shared variances do not explain entirely the associations found between the maternal scales and children's behaviour problems, I conducted these analyses. As a brief reminder, Descriptive Reasoning was significantly associated to both maternal warmth (rho=0.35, $p<0.01$) and negativity (rho=-0.11, $p<0.01$), whilst Relevance was only correlated to maternal warmth (rho=0.07, $p<0.05$). I also used six other parenting variables, such as Parental Monitoring, Parenting Difficulties, Negative Parenting, Child Neglect, Adult Involvement and Parental Supervision to test whether they could explain the association between the maternal scales and children's behaviour problems.

5.3 Methods

5.3.1 Children's measures

Externalizing and internalizing behaviours were assessed when the children were 5, 10 and 12 years-old using the Achenbach family of instruments for two informants: the mother and the teachers. Maternal reports were collected using the Child Behavior Checklist (CBCL; Achenbach, 1991a, 1991b) while the teachers evaluations were gathered using the Teacher's Report Form (TRF; Achenbach, 1991c). Mothers were given the instrument as a face to face interview and

teachers responded using questionnaires returned by post. Informants rated a series of statements about the children's behaviour as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2) in reference to a reporting period of 6 months before the interview. Children's externalizing behaviour scale is the sum of the 43 items of the Delinquency and Aggression subscales, including *"Gets in many fights"* and *"Hangs around with others who get in trouble*". Children's externalizing behaviour combined both mothers' and teachers' reports, unless stated otherwise. At age 5, for this sub-sample, the combined externalizing behaviour scores ranged from 0 to 97 (M=19.68, SD=14.00) while the mothers' and teachers' scores ranged from 0 to 55 (M=14.18, SD=9.52) and from 0 to 59 (M=5.50, SD=7.99), respectively. At age 10, for this sub-sample, the combined scores for children's externalizing behaviour ranged from 0 to 89 (M=15.97, SD=13.96), while the mothers' scores ranged from 0 to 52 (M=10.44, SD=8.96) and the teachers' scores ranged from 0 to 47 (M=5.50, SD=8.47). At age 12, for this sub-sample, for children's externalizing behaviour, the mothers' and teachers' combined scores ranged from 0 to 89.31 (M=16.14, SD=14.19), while the mothers' scores ranged from 0 to 51 (M=10.54, SD=8.91) and the teachers' scores ranged from 0 to 53 (M=5.50, SD=9.35). The internal consistency reliabilities of the parent and teacher reports for children's externalizing behaviour were respectively .89 and .93 at age 5; .91 and .95 at age 10 and .91 and .96 at age 12.

Children's internalizing behaviour scale was the sum of the Anxiety and Withdrawn subscales and included items such as *"Feels too fearful or anxious"* and *"Cries a lot"*. The combined scores for children's internalizing behaviour, for this sub-sample, at age 5 ranged from 0 to 58 (M=12.65, SD=8.84), while the mothers' scores ranged from 0 to 36 (M=7.31, SD=9.52) and the teachers' scores ranged from 0 to 35 (M=5.34, SD=5.56). At age 10, for this sub-sample, the combined scores ranged from 0 to 55 (M=11.85, SD=9.37), while the mothers' scores ranged from 0 to 39 (M=6.76, SD=6.03) and the teachers' scores ranged from 0 to 38 (M=5.10, SD=6.04). At age 12, the combined scores for this sub-sample ranged from 0 to 72 (M=11.28, SD=8.57), while the mothers' scores ranged from 0 to 32 (M=6.64, SD=5.83) and the teachers' scores ranged from 0

to 43 (M=4.62, SD=5.63). The internal consistency reliabilities of the mothers' and teachers' reports were .83 and .84 at phase 5, .87 and .89 at phase 10, and .87 and .84 at phase 12.

5.3.2 Parenting measures

The parenting measures used were: 1) EE, 2) parental monitoring, 3) parenting difficulties, 4) child neglect, 5) negative parenting, 6) adult involvement and 7) parental supervision. Parental monitoring, parenting difficulties and child neglect were collected when the children were ages 10 and 12, negative parenting was collected at age 10 only, whilst adult involvement and parental supervision were gathered exclusively at age 12. I used measures of parenting collected at different ages to test the temporal stability of the associations between the maternal scales and children's behaviour problems and to examine whether these associations were observed over and above the conventional parenting measures during childhood. Parenting measures are described below but to avoid undue repetition please refer to Chapter 3 for a detailed description of the EE and negative parenting measures.

Parental Monitoring: This measure was gathered at age 10 (described in detail in Chapter 4) and age 12. The questionnaire used at age 12 included one more item: "Now (child's name) is older, are you having more difficulty monitoring his/her behaviour?" At age 10, the mothers' scores, ranged from 0 to 20 (M=18.58, SD=2.52). At age 12, they ranged from 0 to 20 (M=17.66, SD=3.34).

Parenting Difficulties: This questionnaire was used at age 10 (described in Chapter 4) and adapted to suit the possible difficulties encountered by parents of 12 year-old children. Mothers were given the instrument as a face to face interview and were asked to rate each item as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). The parenting interview yielded one rating for both twins. The parenting scale ranged from 0 to 31 at age 10 (M=5.22, SD=5.25) and from 0 to 18 at age 12 (M=2.99, SD=2.85). The internal consistency

reliabilities of the mothers' reports were.81 at age 10 and .67 at age 12.

Child Neglect: Data derived from a 6-item questionnaire also part of the Coder's Impression Inventory, collected at ages 10 (described in Chapter 4) and 12. For this sub-sample, the Child Neglect scores ranged from 0 to 12 (M=.98, SD=1.94) at age 10 and from 0 to 10 (M=.67, SD=1.38) at age 12. The internal consistency reliabilities of the mothers' reports were respectively .72 at age 10 and .74 at age 12.

Adult Involvement documented the availability of a stable adult figure that the children could rely on for his/her basic needs. More specifically, children were asked about the adults present in their life, including their parents, relatives, teachers or any other significant adult. Data were reported by the children at phase 12 through an interactive computer task. Children were given the choice to skip a particular question or abort the task at any time. This measure was developed by the E-Risk Study and included 13 items such as "There is an adult who I can go to for advice", "There is an adult who is looking out for me" and "There is an adult who knows where I am most of the time". Children were invited to report if these items were *not true* (0), *sometimes true* (1), or *true* (2). In this sample, scores ranged from 0 to 26 (M= 23.52, SD= 4.71) at age 12. The internal consistency reliability of the children's reports was .85 at age 12.

Parental Supervision: Children were asked directly how closely their mothers monitored their activities at age 12 assessment. This scale included 10 items, which were based on the Parental Monitoring questionnaire used at age 10 and mirrored the Parental Monitoring questionnaire used at age 12; questions were simply rephrased to be asked directly to the children for the purpose of convergent validity. For example, for the parental question: "*Do you know which friends (child's name) hangs about with during his/her free time?"* The mirror question for the children was: "*Do your parents know which friends you hang about with during your free time?"* Parental Supervision scale ranged from 0 to 20 (M= 15.17, SD= 4.01) and the internal consistency reliability of the children's reports was .70 at age 12.

5.3.3 Statistical analyses

The statistical analyses were conducted in three stages. First, I investigated the associations between the maternal scales and children's externalizing and internalizing behaviour at ages 10 and 12, using separate measures from mothers and teachers at ages 10 and 12. I explored these associations using linear regression analyses given that the outcome variables for children's behaviour problems (e.g. externalizing and internalizing behaviour) were continuous. Three models were tested. In the first and second models, I tested the association between Descriptive Reasoning and Relevance separately with children's behaviour problems, whilst controlling for SES disadvantage and children's gender. In the third model, I included simultaneously both maternal scales in the regression equations, as well as SES disadvantage and children's gender to investigate whether the maternal scales were uniquely contributing to children's behaviour problems. The statistical analyses were carried out using separate measures for mothers' and teachers' reports to examine whether there was any reporting bias affecting the results.

Additionally, I explored whether the associations found between the maternal scales and children's behaviour problems at ages 10 and 12 would remain once children's previous behaviour measured at ages 5 and 10 years-old were controlled for. In addition to explore the temporal stability of these associations over time, these analyses allowed me to investigate the directionality of the maternal scales and children's behaviour problems associations further. Two scenarios may be anticipated. If the associations between the maternal scales and children's behaviour problems remained significant, this would suggest that the children's behaviour at age 5 and 10 do not explain the associations between the maternal scales and children's behaviour problems at ages 10 and 12. These results would indicate that more convoluted and distorted maternal narratives evoke higher rates of children's externalizing and internalizing behaviour. However, if the associations between maternal scales and children's behaviour problems were significantly weakened by children's behaviours measured at an earlier age, this would

suggest that children's challenging and difficult behaviour would evoke more convoluted and distorted maternal narratives. I conducted these analyses using data from children's behaviour reported at a) age 10, whilst controlling for previous behaviour gathered at age 5 and b) age 12, controlling for earlier behaviour at age 10. These analyses were carried out using the combined measure of children's behaviour based on mothers' and teachers' reports. Combining data from two informants provides a strong measure of children's behaviour problems, as it informs on children's attitudes at home and school.

Second, to make sure that these results could be generalised to the whole sample, I tested for interactions between the maternal scales and two social demographic factors: SES disadvantage and children's gender. Four interaction terms were created by multiplying each of the two maternal scales with the two factors. I then tested the significance of these effects using linear regressions.

Third, to ensure that the maternal scales capture related, but not identical features of parenting, I tested the associations between maternal scales and eight parenting measures collected when children were ages 10 and 12. I examined the significance and magnitude of these associations using Spearman correlations. I then investigated whether the parenting measures explained the associations previously observed between the maternal scales and children's externalizing and internalizing behaviour at age 10.

I then investigated the same question in relation to the behavioural measures collected at age 12. In order to investigate these questions, I tested whether the parenting measures represented the mechanism through which Descriptive Reasoning and Relevance influence children's behaviour problems. I tested the meditational effects of each parenting measure by including them in the linear regression models testing the associations between the maternal scales and children's behaviour problems. If the associations remained unchanged, this would suggest that the parenting variables did not account for the associations between the maternal scales and children's behaviour problems. However, if these associations were significantly weakened by

the inclusion of the parenting measures in the regression models, this would suggest the parenting measures accounted, at least partially, for the associations between the maternal scales and children's behaviour problems. To achieve this objective, different parenting variables were used: 1) EE maternal warmth and 2) EE negativity, 3) Parental Monitoring, 4) Parenting Difficulties, 5) Negative Parenting, 6) Child Neglect, 7) Adult Involvement and 8) Parental Supervision to test whether they explain the associations between the maternal scales and children's behaviour problems and to verify whether the maternal scales' ratings contributed to children's behavioural problems over and above measures of parenting.

Statistical analyses were conducted using STATA 9.0 (StataCorp, 2005). All statistical tests were controlled for the potential effect of children's gender and the families' level of SES disadvantage. This precaution was taken to make sure that the associations found between maternal scales and children's externalizing and internalizing behaviour were not due to the children's gender and the level of SES disadvantage experienced by their families, as these factors are often related (Brenner and Fox, 1998; Green et al, 2005). Additionally, the statistical analyses were clustered by family to take into account the non-independent nature of the twin study design.

5.4 Results

5.4.1 Maternal scales' associations with children's behaviour problems at ages 10 and 12

Table 5.1 summarizes the regression analyses examining the associations between the maternal scales and children's externalizing behaviour, using separate measure of mothers' and teachers' reports. Descriptive Reasoning was negatively associated to externalizing behaviour at age 12, as reported by mothers and teachers independently, after controlling for SES disadvantage and gender. Relevance was not associated to externalizing behaviour. In addition, Descriptive Reasoning became associated with children's externalizing behaviour at age 10 as reported

my mothers and remained significantly associated to externalizing behaviour at age12 when both scales were included in the model of regression. The contribution of Relevance approached significance at age 10 only. These findings indicated that mothers with more coherent, reflective and knowledgeable narratives had children with less externalizing behaviour.

Table 5.1: Regression Analyses between Maternal Scales and Children's Externalizing Problems at Ages 10 and 12 (N=1050)

	Externalizing behaviour											
	Mothers						Teachers					
	Age 10			Age 12			Age 10			Age 12		
	B	*S.E.*	R^2	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2
SES disadvantage	1.23***	.26	.09	1.07***	.22	.10	.67**	.26	.09	.18	.31	.04
Gender	-2.70***	.77		-2.32**	.74		-4.34***	.74		-3.01**	.96	
Descriptive Reasoning	-.27	.20		-.55**	.19		-.22	.22		-.70**	.25	
SES disadvantage	1.39***	.26	.09	1.29***	.22	.09	.77**	.24	.09	.48	.30	.03
Gender	-2.71**	.77		-2.18**	.74		-4.30***	.75		-2.83**	.96	
Relevance	.60	.72		-.93	.66		-.11	.69		-.87	.85	
SES disadvantage	1.21***	.25	.10	1.07***	.22	.09	.67*	.26	.09	.17	.31	.04
Gender	-2.80***	.77		-2.31**	1.05		-4.36***	.75		-3.02**	.98	
Descriptive Reasoning	-.44*	.22		-.53*	.21		-.27	.22		-.73**	.27	
Relevance	1.27	.77		-.15	.71		.27	.70		.18	.91	

Note. *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

Descriptive Reasoning was negatively associated with children's internalizing behaviour at age 12 as described by mothers only when Relevance was also added into the regression model. These results suggested that mothers with more coherent, relevant, reflective and knowledgeable narratives tended to have older children with less internalizing behaviour. Relevance was positively associated to children's internalizing behaviour, as described by mothers, at age 10 on its own and at age 12 when Descriptive Reasoning was also added to the equation (Table 5.2). Relevance's association with internalizing behaviour remained when using teacher's reports at age 10. Results suggest that when both maternal scales were combined in the same model their association with internalizing problems were strengthened at age 12. This pattern of findings could indicate a suppression effect, observed when the magnitude of the relationship between the independent variable becomes larger when a third variable is included in the model (MacKinnon, Krull, & Lockwood, 2000). In order to verify whether this effect was suppression, and not just a spurious effect, an equation proposed by MacKinnon, Warsi and Dwyer (1995) was used, based on the difference between the two regressions' parameters. The signs and magnitudes of both regression coefficients for Descriptive Reasoning (in models 1 and 3) and Relevance (in models 2 and 3) indicated whether or not the third variable operated as a suppressor (MacKinnon, Krull, & Lockwood, 2000). First, I noted the two regression coefficients for Descriptive Reasoning shared the same sign, as did the two coefficients for Relevance for age 10. Second, when examining the regression coefficients for the maternal scales, r was closer to zero than r_1 for both Descriptive Reasoning (r= -.27, r_1 = -.44) and Relevance (r=.60, r_1 =1.27), which means that a direct effect (in the first and second models) was larger than the total effect (in the third model). These findings suggested the existence of suppression effect (MacKinnon, Krull and Lockwood, 2000), indicating that mothers whose narratives were relevant but incoherent, thoughtless and unrevealing had children with higher numbers of internalizing behaviour at age 12 (Table 5.2).

Table 5.2: Regression Analyses between Maternal Scales and Children's Internalizing Problems at Ages 10 and 12 (N=1050)

	Internalizing behaviour											
	Mothers						Teachers					
	Age 10			Age 12			Age 10			Age 12		
	B	*S.E.*	R^2	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2
SES disadvantage	.72***	.16	.04	.38*	.16	.03	.17	.18	.02	.11	.21	.01
Gender	-.47	.52		-.03	.51		-.98	.54		-.74	.57	
Descriptive Reasoning	.05	.14		-.24	.13		-.17	.14		-.09	.15	
SES disadvantage	.74***	.15	.05	.52**	.15	.02	.28	.17	.02	.14	.18	.01
Gender	-.54*	.52		-.02	.51		-.97	.53		-.72	.57	
Relevance	.94*	.48		.39	.43		.56	.47		-.14	.42	
SES disadvantage	.69***	.16	.05	.36*	.16	.04	.15	.18	.02	.11	.22	.01
Gender	-.56	.52		-.11	.52		-1.05*	.53		-.74	.57	
Descriptive Reasoning	-.10	.15		-.37**	.15		-.31	.15		-.08	.18	
Relevance	1.09*	.51		.94*	.49		1.02*	.49		-.02	.52	

Note. *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

5.4.1.1 Additional investigations regarding the positive associations between Relevance and children's behaviour problems

It was tested whether the positive associations between Relevance and the children's internalizing behaviour at ages 10 and 12 could be due to maternal reporting bias. For example, mothers whose narratives were more relevant could also be more engrossed and anxious about their children's behaviour and, for these reasons, report higher rates of children's behaviour problems. Another explanation for the positive association between Relevance and children's externalizing and internalizing behaviour could be that mothers and teachers may have reported different rates of behaviour problems. For example, mothers could have reported higher rates of difficult or challenging behaviour than the teachers, who are professionally trained and possibly less fazed by them, and this difference could have influenced the direction of the associations between the maternal scales and children's behaviour problems. To test this hypothesis, it was tested whether mothers reported higher rates of problematic behaviours than teachers by examining closely the distributions of mothers' and teachers' ratings on children's externalizing and internalizing behaviour. The children's externalizing behaviour scores ranged from 0 to 52 (M=10.44, SD=8.96) for mothers and from 0 to 47 (M=5.50, SD=8.47) for teachers at age 10. These findings showed that mothers tended to report higher rates of externalizing behaviour in comparison to the teachers' evaluations at age 10. The scores for children's internalizing behaviour ranged from 0 to 39 (M=6.76, SD=6.03) for mothers and from 0 to 38 (M=5.10, SD=6.04) for teachers at age 10. Teachers, however, rated little higher children's internalizing behaviour, but the range of behaviours reported was similar between mothers and teachers.

Furthermore, mothers could differ in the way they report their children's behaviour problems, accounting for more behaviour problems as a function of the way they can concentrate on describing their children, which could in turn account for the positive associations between the Relevance scale and children's behaviour problems. For example, mothers who were relevant

could be more aware, vigilant and observant of their children's behaviours and therefore, may have reported higher externalizing behaviour than mothers with distorted, evasive or preoccupied narratives. To investigate this hypothesis, the mean differences in mothers' and teachers' reports of their children's behaviour problems, according to the mothers' scores from 0 to 3 on the Relevance scale, were examined.

Table 5.3 shows that the largest difference between mothers' and teachers' reports was for the externalizing scale. This difference was particularly noticeable for the children of the relevant mothers. The Relevance scores were subdivided into two groups, evasive and preoccupied mothers (scores 0 and 1) and relevant mothers (scores of 2 and 3). Results indicated that, in comparison to the teachers' independent evaluations (M=5.30), relevant mothers reported higher numbers of children's externalizing behaviour (M=10.34). Conversely, mothers with evasive and preoccupied narratives had the children with the highest rates for externalizing behaviour, as rated by both mothers and teachers.

Findings indicated that differences in mothers' reports on children's externalizing behaviour varied according to their scores in the Relevance scale and these could explain the positive association found between the Relevance scale and children's behaviour problems.

Table 5.3: Means for Children's Behaviour Problems, According to Mothers and Teachers

Relevance score		Externalizing		Internalizing	
		Mothers	Teachers	Mothers	Teachers
≤1	Mean	11,76	8,02	6,85	5,34
	S.D.	10,19	11,34	6,72	6,43
	N	73	68	73	68
≥ 2	Mean	10,34	5,30	6,76	5,08
	S.D.	8,85	8,19	5,98	6,01
	N	977	882	977	882
Total	Mean	10,44	5,50	6,76	5,10
	S.D.	8,96	8,47	6,03	6,04
	N	1050	950	1050	950

To investigate whether mothers' reports on children's externalizing behaviour varied according to their ratings in the Relevance scale, the means of externalizing behaviour reported by mothers and teachers were examined according to the four different scores for the Relevance scale (Table 5.4). Findings indicated that the mothers, whose narratives scored high for Relevance, reported more than twice the number of children's externalizing behaviour informed by the children's teachers. The children, whose mothers' narratives were coded evasive and/or preoccupied, received the highest scores for externalizing behaviour, by both their mothers and teachers independently.

Additionally, findings suggested that mothers, whose narratives rated high for Relevance scale, were more likely to have children with the highest scores for internalizing behaviour, according to their teachers. Also, there was an extreme group of mothers, whose narratives were rated

preoccupied, and whose children had consistently the highest rates for externalizing behaviour, as rated by both mothers and teachers. Therefore, the preoccupied mothers' quality of reporting on children's behaviour problems was reliable, as their ratings approached their children's teachers' scores.

Table 5.4: Means for Mothers and Teachers Reports of Behaviour According to the Relevance Scores

Relevance Scores		Externalizing		Internalizing	
		Mothers	Teacher	Mothers	Teachers
0	Mean	12,37	10,26	8,63	5,52
	SD	10,13	11,89	7,69	6,72
	N	29	25	29	25
1	Mean	11,36	6,71	5,68	5,24
	SD	10,33	10,94	5,79	6,33
	N	44	43	44	43
2	Mean	10,01	5,22	6,41	4,81
	SD	8,48	8,00	5,66	5,96
	N	710	629	710	629
3	Mean	11,23	5,50	7,69	5,78
	SD	9,74	8,64	6,70	6,09
	N	267	253	267	253
Total	Mean	10,44	5,50	6,76	5,10
	SD	8,96	8,47	6,03	6,04
	N	1050	950	1050	950

5.4.2 Maternal scales' associations with children's behaviour problems at ages 10 and 12, controlling for previous behaviour at ages 5 and 10

To take advantage of the longitudinal nature of the data, regression analyses were used to test whether the association between the maternal scales and children's externalizing and internalizing behaviour would remain after controlling for children's previous behaviour problems. These analyses aimed to test the directionality of the associations between the maternal scales and children's behaviour problems.

Descriptive Reasoning remained negatively associated with children's externalizing behaviour at age 12, whilst its association at age 10 was reduced, after controlling for children's externalizing behaviour at age 5, (Table 5.5). Relevance remained not significantly associated with externalizing behaviour reported at ages 10 and 12 once externalizing behaviour at age 5 were controlled for. Results indicate that Descriptive Reasoning was predicting children's externalizing behaviour over and above their initial levels of behaviour problems.

Descriptive Reasoning and Relevance remained, respectively, negatively and positively associated with internalizing behaviour at ages 10 and 12 once previous internalizing behaviour at age 5 were controlled for (Table 5.5). Results show that Descriptive Reasoning was associated with children's externalizing and internalizing behaviour, whilst Relevance was related to internalizing behaviour, over and above children's initial levels of behaviour problems. Thus, previous internalizing behaviour did not seem to account for the associations found between maternal scales and internalizing problems at age 10. This suggests that more convoluted and distorted maternal narratives may evoke higher rates of children's internalizing behaviour.

Afterwards, it was examined whether the maternal scales' derived at age 10 would be associated with children's behaviour problems at age 12, while controlling for children's externalizing and internalizing behaviour reported at age 10. Descriptive Reasoning contributed significantly to the children's externalizing and internalizing behaviour at age 12, once behavioural problems at age

10 were controlled for. Conversely, the association previously shown between Relevance and internalizing problems at age 12 did not remain after controlling for behaviour problems at age 10 (Table 5.6). These results indicate that Descriptive Reasoning was associated with children's externalizing and internalizing behaviour at age 12 over and above their initial and concurrent levels of behaviour problems at ages 5 and 10. These suggest that more incoherent and evasive maternal narratives may evoke higher rates of children's externalizing and internalizing behaviour.

Table 5.5: Regression Analyses for Association between Maternal Scales and Children's Behaviour Problems at Ages 10 and 12, Controlling for Behaviour at Age 5[1]

	Externalizing			Internalizing		
Age 10 - Step 1	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2
SES disadvantage	1.56***	.32	.13	.62**	.21	.05
Gender	-6.82***	.99		-.90	.67	
Descriptive Reasoning	-.91**	.30		-.55**	.20	
Relevance	1.50	.82		1.84**	.61	
Age 10 - Step 2						
SES disadvantage	.88**	.30	.36	.31	.20	.22
Gender	-4.15***	.86		-.68	.60	
Descriptive Reasoning	-.44	.26		-.32*	.17	
Relevance	.71	.72		1.78**	.55	
Behaviour age 5	.47***	.04		.44***	.04	
Age 12 – Step 1 SES disadvantage	1.30***	.29	.11	.57**	.20	.03
Gender	-5.55***	1.05		-.09	.63	
Descriptive Reasoning	-1.20***	.30		-.61**	.20	
Relevance	.49	.90		1.34**	.54	
Age 12 – Step 2						
SES disadvantage	-.64*	.27	.33	.34	.18	.12
Gender	2.98**	.91		.01	.58	
Descriptive Reasoning	-.72**	.26		-.44*	.18	
Relevance	-.28	.83		1.28*	.53	
Behaviour age 5	-.47***	.04		-.33***	.03	

Note. *B* = Coefficient and *S.E.* = Standard Error; [1]Behaviour at age 5 means externalising for the analyses predicting externalising behaviour and internalising for those predicting internalising behaviour; *** p <.001; ** p < .01; * p < .05.

Table 5.6: Regression Analyses for Association between Maternal Scales and Children's Behaviour Problems at Age 12, Controlling for Behaviour at Age 10[1] (N=1036)

	Externalizing			Internalizing		
Age 12 – Step 1	*B*	*S.E.*	R^2	B	*S.E.*	R^2
SES disadvantage	1.30***	.29	.11	.57**	.20	.03
Gender	-5.55***	1.05		-.09	.63	
Descriptive Reasoning	-1.20***	.30		-.61**	.20	
Relevance	.49	.90		1.34**	.55	
Age 12 - Step 2						
SES disadvantage	.33	.25	.42	.25	.17	.28
Gender	-1.33	.76		.26	.50	
Descriptive Reasoning	-.62**	.21		-.34*	.15	
Relevance	.46	.74		.38	.48	
Behaviour age 10	.62***	.04		.50***	.03	

Note. [1]Behaviour at age 10 means externalising for the analyses predicting externalising behaviour and internalising for those predicting internalising behaviour; *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

5.4.3 Social demographic potential confounding factors

To ensure these findings were not being influenced by social demographic factors and could be generalised to the whole sample, I tested for interactions effects between the maternal scales, SES disadvantage and children's gender in relation to children's externalizing and internalizing behaviour at age 10. To achieve this objective, four interaction terms were created to examine the moderating effects of these socio-demographic variables on the association between maternal scales and children's behaviour problems at age 10 using regression analyses. No significant interaction effects were found (Table 5.7). Results thus suggested that these social demographic variables did not modify the associations observed between the maternal scales and children's behaviour problems. These findings indicate that the associations found in this study are valid to the entire sample, irrespectively of the level of socio-economic deprivation experienced by the family or the gender of the twins.

Table 5.7: Summary of the Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Behaviour Problems at Age 10

	Externalizing			Internalizing		
	B	S.E.	R^2	B	S.E.	R^2
SES disadvantage	1.56***	.32	.13	.63**	.21	.14
Gender	-8.64*	4.34		-3.94	2.86	
Descriptive Reasoning	-1.27	.94		-1.58	.61	
Relevance	1.50	.83		1.84**	.60	
Descriptive Reasoning x Gender	.24	.54		.41	.36	
SES disadvantage	1.56***	.32	.14	.62**	.21	.05
Gender	-5.93	3.57		-4.13	2.50	
Descriptive Reasoning	-.91**	.30		-.54	.20	
Relevance	2.12	2.75		-.42**	1.98	
Relevance x Gender	-.41	1.59		1.50	1.12	
SES disadvantage	1.38	1.03	.13	1.21	.75	.06
Gender	-6.81***	.99		-.90	.67	
Descriptive Reasoning	-.96*	.40		-.36	.28	
Relevance	1.49	.83		1.87	.61	
Descriptive Reasoning x SES disadvantage	.02	.13		-.08	.10	
SES disadvantage	.94	1.00	.13	.66	.81	.06
Gender	-6.81***	1.00		-.89	.67	
Descriptive Reasoning	-.94**	1.04		-.55	.20	
Relevance	1.00	.30		1.88**	.82	
Relevance x SES disadvantage	.29	.43		-.02	.37	

Note. *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

5.4.4 Does parenting mediate the associations between maternal scales and children's behaviour problems?

First, linear regression models were used to explore whether the maternal scales were associated to children's behaviour problems over and beyond different parenting measures. I started by testing these associations in relation to maternal warmth and negativity, derived from EE. The regression models include both maternal scales to account for the possibility of suppression effects previously reported on the maternal scales.

Table 5.8 shows that Descriptive Reasoning and Relevance were not significantly associated with children's externalizing behaviour once maternal warmth was included in the model. These findings suggested that the covariance between the maternal scales and maternal warmth accounted for part of the association found between Descriptive Reasoning and children's externalizing behaviour at age 10. Descriptive Reasoning remained marginally associated with children's externalizing behaviour when controlling for maternal negativity, whilst no significant association was detected between the problematic behaviours, negativity and the Relevance scale (Table 5.8). Thus, maternal negativity lowered the association between Descriptive Reasoning and children's externalizing behaviour, but to a lesser extent than maternal warmth.

Relevance remained positively associated with children's internalizing behaviour when the contribution of maternal warmth was taken into account, whilst Descriptive Reasoning did not. When controlling for maternal negativity, both maternal scales remained significantly associated to children's internalizing behaviour (Table 5.8). These results indicate that maternal warmth partially accounted for the associations observed between Descriptive Reasoning and children's internalizing problems whereas the inclusion of the negativity scale did not affect these associations. Thus, these findings suggest that the maternal scales may have a unique contribution over other established narrative measures, in particular, maternal negativity.

To test whether the mediation effect of maternal warmth on Descriptive Reasoning for

externalizing behaviour at age 10 was significant, I carried out the Sobel test. This statistical test determines the significance of the indirect effect of the mediator (Sobel, 1982). Results indicated that the indirect effect of Descriptive Reasoning on the children's externalizing behaviour through maternal warmth was significant (Sobel Test Statistic = -5.50, $p<0.001$), suggesting that maternal warmth acts as a mediator of the association between Descriptive Reasoning and children's externalizing behaviour at age 10.

Table 5.8: Regression Analyses for Association between Maternal Scales and Children's Behaviour, Controlling for EE Measures at Age 10 (N=1050)

	Externalizing			Internalizing		
Age 10 - Step 1	*B*	*S.E.*	R^2	*B*	*S.E.*	R^2
SES disadvantage	1.56***	.32	.13	.62**	.21	.05
Gender	-6.82***	.99		-.90	.67	
Descriptive Reasoning	-.91**	.30		-.55**	.20	
Relevance	1.50	.82		1.84**	.61	
SES disadvantage	1.49***	.31	.19	.59**	.20	.08
Gender	-6.50***	.98		-.78	.66	
Descriptive Reasoning	-.31	.29		-.29	.20	
Relevance	.99	.80		1.60**	.61	
Maternal warmth	-3.34***	.56		-1.44**	.41	
SES disadvantage	1.25***	.28	.38	.52**	.20	.11
Gender	-6.39***	.89		-.77	.65	
Descriptive Reasoning	-.48	.26		-.41*	.19	
Relevance	.44	.71		1.50*	.59	
Maternal negativity	3.06***	.23		.96***	.16	

Note. *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

The strength of the associations between other four concurrent parenting variables, maternal scales and children's behaviour problems at age 10 were also examined. As reported in Table 5.9, all four parenting measures were significantly related to one another. More specifically, parenting difficulties, negative parenting and child neglect were positively associated to the other measures, whilst parental monitoring was negatively associated to these measures. These associations were weak, indicating that the parenting variables captured related but different aspects of child rearing practices. One exception to that general rule was observed between child neglect and negative parenting which were highly associated. Further statistical analyses could progress without problems of multicollinearity. The maternal scales were negatively associated to parenting difficulties, negative parenting and child neglect and had the strongest associations to child neglect and negative parenting. Descriptive Reasoning was also positively associated to parental monitoring. However, all these associations were relatively weak. The parenting measures were also significantly associated to children's behaviour problems at age 10 (Table 5.9). More specifically, scores indicating increased parenting difficulties, negative parenting and child neglect were associated with higher rates of behaviour problems. Finally, parental monitoring was negatively associated with children's behaviour problems.

Table 5.9: Spearman Correlations between Parenting Measures, Children's Externalizing and Internalizing Behaviour and Maternal Scales at Age 10 (N=1050)

Age 10	Parenting			Maternal scales	Children's behaviour		
	Parenting Difficulties	Negative Parenting	Child Neglect	Descriptive Reasoning	Relevance	Externalizing	Internalizing
Parental Monitoring	-.23***	-.16***	-.19***	.16***	.02	-.26***	-.12***
Parenting Difficulties		.22***	.24***	-.11***	-.07*	.32***	.29***
Negative Parenting			.53***	-.25***	-.11***	.24***	.16***
Child Neglect				-.33***	-.12***	.21***	.18***

Note. *B* = Coefficient and *S.E.* = Standard Error. *** p <.001; ** p < .01; * p < .05.

Similar analyses were repeated for parenting measures and behaviour problems collected when the children were age 12 (Table 5.10). All parenting measures were significantly associated to each other. Parental monitoring was positively associated to parental difficulties, adult involvement and parental supervision and negatively related to child neglect. Parental difficulties was positively associated to child neglect and negatively related to adult involvement and parental supervision. Child neglect was negatively related to adult involvement and parental supervision, whilst these were positively associated to one another. These significant associations were weak to moderate, suggesting no presence of multicollinearity. Descriptive Reasoning was significantly associated to all five parenting measures from age 12. More specifically, it was positively related to parental monitoring, adult involvement and parental supervision and negatively associated to parental difficulties and child neglect. Relevance was only negatively related to adult involvement. Parental monitoring and adult involvement were negatively associated, whilst parental difficulties and child neglect were positively related, to children's externalizing and internalizing behaviour. Parental supervision, however, was not consistently related to children's behaviour problems, as it was negatively associated to externalizing and positively associated to internalizing behaviour. Despite this exception, these results were overall consistent to our findings derived from age 10.

Table 5.10: Spearman Correlations between Parenting Measures, Children's Behaviour Problems at Age 12 and Maternal Scales (N=1036)

Age 12	Parenting measures				Maternal scales		Children's behaviour	
	Parenting Difficulties	Child Neglect	Adult Involvement	Parental Supervision	Descriptive Reasoning	Relevance	Externalizing	Internalizing
Parental Monitoring	-.31***	-.18***	.13***	.27***	.16***	-.01	-.27**	-.15***
Parenting Difficulties		.14***	-.09**	-.14***	-.09**	-.02	.32***	.33***
Child Neglect			-.18***	-.21***	-.30***	-.09**	.26***	.13***
Adult Involvement				.47***	.15***	.06	-.21***	-.14***
Parental Supervision					.14***	.04	-.31***	-.10**

Note. *B* = Coefficient and *S.E.* = Standard Error; *** p <.001; ** p < .01; * p < .05.

I performed a series of linear regression models to test whether these parenting measures mediated the associations observed between the maternal scales and children's behaviour problems. Five models were tested and they were all adjusted for gender and SES disadvantage. Model 1 presents the associations previously reported between the maternal scales and children's externalizing and internalizing behaviour. Model 2, 3, 4 and 5 included subsequently each parenting measure in the regression equation (i.e. in Model 2: parental monitoring; 3: parenting difficulties; 4: child neglect) allowing therefore to test whether the inclusion of these measures affected the association between the maternal scales and the children's behaviour.

Table 5.11 summarizes findings in relation to externalizing and internalizing behaviour at age 10. Descriptive Reasoning remained significantly associated with externalizing behaviour once the parenting measures were included in each model, indicating that parental monitoring, parental difficulties, negative parenting and child neglect did not mediate the association between this maternal scale and externalizing behaviour at age 10. Similar results were found for internalizing behaviour at age 10 with one exception. The inclusion of child neglect weakened the association between Descriptive Reasoning and internalizing behaviour. This finding suggested that child neglect partially mediate the relationship between Descriptive Reasoning and children's internalizing behaviour at age 10.

Parental monitoring did not seem to have an effect on Relevance's association with children's externalizing behaviour, as it remained not significant. Parental difficulties, negative parenting and child neglect, however, seemed to have strengthened Relevance's association with externalizing behaviour, as they became significant (Table 5.11). In relation to internalizing behaviour, all parenting measures seemed not to weaken Relevance's association to internalizing behaviour, as they remained significant. These consistent findings at age 10 suggested that parental difficulties, negative parenting and child neglect did not explain the relationship found between the maternal scales and children's behaviour problems.

At age 12, parental monitoring, parental difficulties, child neglect, adult involvement and adult supervision did not alter the association between Descriptive Reasoning and children's externalizing and internalizing behaviour, as these remained significant (Table 5.12). Additionally, these parenting measures did not seem to influence Relevance's relationship with children's externalizing behaviour, as this remained not significant for age 12. In relation to Relevance's association to internalizing behaviour, parental monitoring, parental difficulties, child neglect, adult involvement and adult supervision did not seem to completely explain the association between Relevance and internalizing behaviour, as they remained significantly associated at age 12.

In sum, when parenting variables were added to the regression equation, parental monitoring, parental difficulties, negative parenting, adult involvement and adult supervision did not seem to mediate the associations between maternal scales and children's externalizing and internalizing behaviour at ages 10 and 12. Child neglect, however, seemed to partly explain the association between Descriptive Reasoning and internalizing behaviour at age 10.

Table 5.11: Regression Analyses between Maternal Scales, Parenting Measures and Children's Externalizing and Internalizing Behaviour at Age 10 (N=1050)

Age 10		Maternal Scales			*Parental Monitoring*			*Parenting Difficulties*			*Negative Parenting*			*Child Neglect*		
		Model 1			Model 2			Model 3			Model 4			Model 5		
		B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2
Externalizing	*Descriptive Reasoning*	-.91**	.30	.13	-.79**	.29	.19	-.90**	.29	.19	-.60*	.27	.17	-.55*	.28	.17
	Relevance	1.50	.82		1.35	.82		1.93*	.79		1.62*	.79		1.65*	.80	
	Parenting measure[1]				-1.16***	.29		.75***	.11		2.07***	.37		1.56***	.35	
Internalizing	*Descriptive Reasoning*	-.55**	.20	.05	-.53**	.20	.06	-.54**	.18	.13	-.43*	.18	.06	-.31	.19	.09
	Relevance	1.84**	.61		1.83**	.61		2.15***	.56		1.89**	.90		1.94**	.59	
	Parenting measure[1]				-.15	.14		.53***	.07		.81***	.21		1.03***	1.69	

Note. All models were adjusted for gender and SES. [1]Measure added in Model 2: parental monitoring; 3: parenting difficulties; 4: negative parenting and 5: child neglect. *B* = Coefficient and *S.E.* = Standard Error, *** p <.001; ** p < .01; * p < .05.

Table 5.12: Regression Analyses between Maternal Scales, Parenting Measures and Children's Externalizing and Internalizing Behaviour at Age 12 (N=1036)

Age 12		Maternal Scales Model 1			*Parental Monitoring* Model 6			*Parenting Difficulties* Model 7			*Child Neglect* Model 8			*Adult involvement* Model 9			*Adult supervision* Model 10		
		B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2
Externalizing	*Descriptive Reasoning*	-1.20***	.30	.11	-1.05***	.29	.17	-1.18***	.26	.19	-.89**	.29	.13	-1.10***	.30	.13	-1.09***	.29	.16
	Relevance	.49	.90		-.01	.89		.52	.87		.42	.90		.57	.92		.56	.94	
	Parenting measure[1]				-1.77***	.24		1.61***	.21		2.14***	.48		-.34**	.12		-.70***	.14	
Internalizing	*Descriptive Reasoning*	-.61**	.20	.03	-.56**	.29	.05	-.60***	.26	.12	-.50**	.18	.04	-.54**	.20	.06	-.60**	.20	.04
	Relevance	1.34**	.55		1.22*	.55		1.33*	.52		1.32*	.55		1.37*	.55		1.34*	.55	
	Parenting measure[1]				-.49**	.15		.97***	.12		.75*	.33		-.27**	.09		-.20*	.09	

Note. All models were adjusted for gender and SES. [1]Measure added in Model 6: parental monitoring; 7: parenting difficulties; 8: child neglect; 9: adult involvement and 10: adult supervision. *B* = Coefficient and *S.E.* = Standard Error, *** p <.001; ** p < .01; * p < .05.

To test further whether the presumed partial mediation effect of child neglect on Descriptive Reasoning for internalizing behaviour at age 10 was significant and not just due to the fact that one more variable, which was associated to behavioural problems, was included in the regression model, I carried out the Sobel statistical test. Results suggested that the indirect effect of Descriptive Reasoning on the children's internalizing behaviour through child neglect was significant (Sobel Test Statistic = -4.41, $p<0.001$), indicating that child neglect mediated this association.

5.5 Discussion:

This study aimed to document further the validity and utility of the newly designed maternal scales by examining their associations with children's externalizing and internalizing behaviour. Using a prospective population-based study of children in the UK, findings indicated that mothers, whose narratives were more coherent, reflective and open, seemed to have children with significantly fewer externalizing behaviour. Furthermore, mothers whose narratives were relevant, but incoherent, thoughtless and avoidant, tended to have children with more internalizing behaviour.

The positive association between Relevance and children's externalizing and internalizing behaviour was an unexpected finding. Mothers with narratives that focused more on describing the targeted child reported higher levels of children's behaviour problems. To investigate whether this finding was due to a maternal reporting bias, I compared mothers' and teachers' independent reports on children's behaviour problems. Mothers, whose narratives showed little or no inconsistency, reported more externalizing behaviour for their children; whilst mothers whose narratives were coded as evasive or preoccupied tended to have children with higher externalizing behaviour, as rated by both mothers and teachers. These results suggested that the relevant mothers reported higher rates of externalizing behaviour than the children's teachers,

whilst the preoccupied and evasive mothers had the children with the highest rates of externalizing behaviour, according to both informants. It is likely that the mothers, who were more focused on the task of describing their children, were either more aware or anxious about their children's behaviour than the children's teachers and, for these reasons, reported higher rates of externalizing behaviour. Their children had the highest rates of internalizing behaviour according to the teachers, suggesting that children, whose mothers were more focused on the task of describing them, behaved in a more anxious, depressed or withdrawn way at school. Previous research had identified that maternal attributes, including anxiety and over preoccupation about their children, were related to increased rates of internalizing behaviour in children (Bayer et al., 2006; McCarty et al., 2005). A longitudinal study investigating the etiology and development of anxiety symptoms in children from infancy to adolescence, using a variety of observational, projective and objective measures, suggested that the associations found between maternal anxiety and children's internalizing behaviour were genuine and not due to maternal reporting bias (Bosquet & Egeland, 2006). Thus, it is likely that the Relevance scale might be capturing attributes within the maternal narratives associated to the mothers' level of anxiety and over preoccupation towards their children's behaviour that, in turn, were related to higher rates of children's internalizing behaviour. These results seemed to support consistent findings from previous chapters, which indicated that Relevance was maternal specific, rather than child dependent, and associated to mothers' personality features, which could influence the quality of their reporting.

When I tested the directionality of the associations between the maternal scales and children's behaviour problems, results indicated that Descriptive Reasoning was related to children's externalizing and internalizing behaviour at ages 10 and 12 over and above their initial and concurrent levels of behaviour problems. Relevance's association with externalizing behaviour at ages 10 and 12 became not significant, whilst its association to internalizing behaviour at age 10 remained after controlling for previous problems at age 5. Thus, less coherent, reflective and

informative narratives were associated with higher rates of externalizing behaviour in children, whilst more convoluted and distorted maternal narratives were associated with higher rates of internalizing behaviour. However, although the maternal scales were coded by independent raters, both maternal scales' and children's behaviour were based on reports from the same person and shared variance biases might be affecting these results, by making the associations between the maternal scales and mothers' reports on their children's behaviour stronger.

Nevertheless, results have suggested that the contributions of the maternal scales on children's externalizing and internalizing behaviour were not completely explained by other parenting measures, indicating that the maternal scales were capturing unique aspects of the mothers' narratives related to their children's behaviour. Additionally, these findings were strengthened by the absence of a moderating effect of SES disadvantage and gender on these associations. Results also showed that children whose mothers' narratives were coded as being evasive and preoccupied received the highest scores for externalizing behaviour, as rated consistently by both mothers and teachers. These results confirmed my initial hypothesis that mothers whose narratives presented severe distortions would have children with higher rates of challenging and difficult behaviour. These findings seemed to support the validity of the newly designed maternal scales, because they suggested that the structural distortions in the maternal narratives, as summarized by the new scales, reflect existing differences in the mothers which were useful in predicting the highest rates of externalizing behaviour in children. In sum, these findings seem to substantiate the validity of these new maternal scales, as these seemed to capture existing features of maternal narratives and the utility of the maternal scales because, as they were associated to children's externalizing and internalizing behaviour.

Another important finding was the partial mediation of two parenting measures, maternal warmth and child neglect, on the association between Descriptive Reasoning and children's behaviour problems. These findings suggested that mothers whose narratives were coherent, reflective and

open tended to be warm when describing their children. This covariation seemed to have accounted for most of the association found between Descriptive Reasoning and children's externalizing behaviour at age 10. In relation to child neglect, results indicated that mothers who were less coherent, reflective and open tended to be more neglectful towards their children and this seemed to explain partially the relationship between Descriptive Reasoning and internalizing behaviour at age 10. These findings represented an important limitation to this study, because it indicated that the usefulness of our maternal scales were partial, as they seemed to have been moderately captured by these two parenting measures.

Previous research indicated that mothers with open and informative narratives were more likely to be warm, supportive and helpful; whilst mothers with more restricted or idealised narratives were less affectionate and more controlling to their children (Adam et al., 2004; Bosquet & Egeland, 2001; Crowell & Feldman, 1988). Consistent with these findings, I have shown that the level of maternal warmth found in the way mothers relate to their children seemed to be associated to structural features of their narratives. These associations probably implied in the dampening effect observed in this study's results.

Nevertheless, this study has uniquely contributed to broaden our knowledge on maternal narratives, as it was the first to derive structural scales based on mothers' short descriptions of their children and to explore their associations with children's behaviour problems. Findings have suggested that the new maternal scales were associated to children's externalizing and internalizing behaviour at ages 10 and 12, over and above children's initial levels of behaviour problems, even though some dampening effect had been expected given the stability of children's behaviour problems over time. These outcomes were supported by the absence of a moderator effect of SES disadvantage and gender. Additionally, findings suggest that other parenting variables, such as parental monitoring, parental difficulties, negative parenting, adult involvement and maternal negativity, did not either affect or, conversely, strengthen the association between the maternal scales and children's behaviour problems. These findings

supported the validity and utility of the maternal scales, as they seemed to capture structural aspects of the maternal narratives, which were related to children's behaviour problems that could not be entirely explained by parenting behaviour. Therefore, it is likely that the new maternal scales contribute in a unique way to the study of the maternal narratives and its association to children's behaviour problems.

These results were limited by some methodological weaknesses. First, this sample consisted of twin children and, for this reason, I cannot be certain that these findings generalise to singletons. However, findings on the association between maternal narratives and children's behavioural outcomes in twins were shown to be similar to the studies of singletons (Caspi et al., 2004; McCarty et al., 2004). Second, shared informant and method variance could have inflated this thesis' findings. This is because when testing the associations between the maternal scales' ratings and children's behaviour problems, contrasting mothers' and teachers' evaluations separately, results were weakened. For example, Descriptive Reasoning's association to externalizing behaviour remained only at age 12, after controlling for SES disadvantage and gender, when using data reported by teachers. Relevance's association to externalizing problems only approached significance at age 10 when using data reported by mothers, whilst no association was found using data reported by teachers. In relation to children's internalizing problems, Relevance remained significantly associated to both measures at age 10. However, when using only data reported by mothers, Relevance as well as Descriptive Reasoning were associated with internalizing problems at age 12. These findings indicate that shared method variance seemed to be inflating these results, as the scales were not as strongly related to teacher rated behaviour problems. Furthermore, previous EE research have shown that EE maternal negativity toward their 5-year-old MZ twins were significantly correlated with differences between the MZ twins' behaviour problems, both cross-sectionally and longitudinally (Caspi, 2004).The negative content of maternal narratives, as measured by EE, seem to capture the

associations between differences in mothers' speech and differences in the twins' behaviour regardless of whether mothers or teachers rated the children's behaviour. I tried to minimise the potential problem of shared informant and method variance, by using multiple measurement modalities, such as maternal speech sample, home visitor ratings, mothers' and teachers' reports of problematic behaviours. Additionally, I examined the associations between children's behaviour problems and mothers' and teachers' evaluations separately. Furthermore, potential differences in the mean levels of children's behaviour reported by mothers and teachers could mirror genuine differences in their behaviour at home and at school, rather than being a sole consequence of reporting biases. Future longitudinal research, using both reported and observed data on children's behaviour across different environments, could help to address these questions further by investigating whether any differences in children's behaviour between mothers' and teachers' reports are due to differences in the quality of their reporting or reflected actual behaviour differences across distinct environments.

Overall, this study's results support the validity and usefulness of the new maternal scales in addressing the structural aspects of the maternal narratives and their association to children's behaviour problems. These findings suggest that the structural features summarized by the new scales prove useful when trying to predict children's externalizing and internalizing behaviour, even after taking into account socio-demographic factors, parenting measures and the children's own early history of behavioural problems. The new maternal scales seemed to contribute in a unique way to further our knowledge on maternal narratives and narrative research. Furthermore, it is likely that there are other factors, such as the children's own cognitive development, that could potentially influence the associations between the maternal scales and children's externalizing and internalizing behaviour. By investigating whether the maternal scales were related to children's own cognitive development, we could maybe understand further how children's behaviour might have been shaped by their mothers' narratives. Thus, the following chapter will investigate whether the maternal scales were associated with children's intellectual

ability, academic performance and their capacity to interpret social situations and behave appropriately in social circumstances.

Chapter 6: Maternal scales and children's cognitive development

The findings presented in the previous chapters showed that the maternal scales were valid, reliable and associated with mothers' personality characteristics. Moreover, maternal scales were associated with children's externalizing and internalizing behaviour. The associations found between the maternal scales and children's behaviour problems could not be explained by most parenting measures. To better understand how children's behaviour might be influenced by the maternal narratives, this chapter focuses on examining the associations between the maternal scales and children's cognitive development and social behaviour. More specifically, it explores the associations between the maternal scales, children's intellectual ability, their academic performance and their capacity to socially behave appropriately both at home and school.

6.1 Introduction

Children's intellectual ability and social behaviour have attracted considerable interest over the years. Research on intellectual ability focuses on children's capacity to process, retain and retrieve information (Barnett, 1995). Research on social behaviour investigates children's ability to interpret different social scenarios and to adjust their behaviours accordingly for participating effectively in social settings and establish positive interpersonal relationships (Marton, Abramoff, & Rosenzweig, 2005; Odom, McConnell, & Brown, 2008).

Empirical evidence has shown that children's low cognitive ability and behaviour problems have negative long-term consequences (Miles & Stipek, 2006). For example, in a longitudinal study in England, children who were poor readers and who had behavioural problems were much more likely to drop out of school and have unstable work patterns, low job skills, and delinquent behaviour in adulthood than those with either behaviour problems or poor reading skills

(Maughan, Gray, & Rutter, 1985). Many studies have found positive associations between children's social behaviour and academic achievement, with aggressive children and children who exhibit poor social skills performing worst academically than children who exhibit good social skills (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; McGee, Williams, Share, Anderson, & Silva, 1986; National Institute of Child Health & Human Development [NICHD], 2004; Normandeau, & Guay, 1998; Ollendick, Weist, Borden, & Greene, 1992; Trzesniewski, Moffit, Caspi, Taylor, & Maughan, 2006). Poor academic performance has also been consistently found to co-occur with or to be a predictor of antisocial behaviour (Hawkins, Farrington, & Catalano, 1998; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Huizinga, & Jakob-Chien, 1998; Johnson, McGue, & Iacono; 2006). Additionally, low intellectual coefficient (IQ) has been identified as a risk factor for the emergence and continuity of antisocial behaviour across the life course in both prospective and cross-sectional studies, even when other relevant risk factors were statistically controlled for (Baker, Blacher, Crnic, & Edelbrock, 2002; Dekker & Koot, 2003; Dykens, 2000; Emerson, 2003; Koene, Caspi, Moffitt, Rijsdijk, & Taylor, 2006; Nigg & Huang-Pollock, 2003; Simonoff, et al., 2004; Strømme & Diseth, 2000).

Intellectual disability has been estimated to affect 1% of the population (Harris, 2006). Considering that more than 30% of children and adolescents with intellectual disabilities are known to have a diagnosable psychiatric disorder, and between 5% and 15% have severe antisocial behaviour (Dekker & Koot, 2003; Emerson, 2003), understanding the associations between maternal scales with children's intellectual ability and social behaviour could have useful implications. These could be particularly useful to inform educational interventions, aimed at improving school performance and academic achievement, and clinical practice directed at reducing children's social maladjustment and antisocial behaviour.

The development of children's intellectual and social skills is influenced by a number of factors. More specifically, the impact of early physical and social deprivation on psychological and cognitive development remains an issue of both scientific and clinical interest (Galler & Ramsey,

1985; Grantham-McGregor, Walker, & Chang, 2000; Liu, Raine, Venables, Dalais, & Mednick, 2003). For example, evidence suggests that children from deprived backgrounds tended to experience lack of language stimulation at home and, consequently, develop lower levels of vocabulary and conceptual development which, in turn, could compromise their reading ability and academic achievement (Duncan et al., 1994; Duncan et al., 1998; de Jong & Leseman, 2001; Storch & Whitehurst, 2002; Lugo-Gil & Tamis-LeMonda, 2008). Additionally, research has shown that socio-economic deprivation and hostile parenting behaviour (Jaffee, Moffitt, Caspi, & Taylor, 2004; Kim-Cohen et al., 2004; Moffitt et al., 1993; Moffitt et al., 2002) disrupt children's optimal intellectual and social functioning. Conversely, positive familial environments such as parental sensitivity, cognitive stimulation and parental warmth have been associated with higher children's intellectual ability, including normative language development, intellectual and literacy performances, school readiness and high academic achievement (Bornstein & Tamis-LeMonda, 1989; Landry, Smith, Swank, Assel, & Vellet, 2001; Morrison & Cooney, 2002). Perhaps central to these findings, the emotional quality of mother-child interactions was associated with higher children's cognitive competencies, such as school readiness skills at ages 5 and 6, IQ scores at age 6, vocabulary and mathematics performances at age 12 (Estrada, Arsenio, Hess, & Holloway, 1987). These studies focused mostly on the quality of mother-child interactions and the level of deprivation experienced by these families, not taking into consideration the way mothers organized their thoughts about their children and how these might have influenced the way they interpreted their children's behaviour and adjusted their responses to them accordingly. Thus, exploring the potential associations between the maternal scales and children's intellectual ability could represent a unique development to research and clinical practice.

Many studies have investigated how parenting styles influence children's social behaviour. Evidence has shown that parents' antisocial behaviour promote children's maladjustment via genetic, but also strong environmental rearing effects (Arseneault et al., 2003; Jaffee et al., 2004). Sensitive and responsive mothers tend to promote better self-control and regulation strategies, which would foster higher rates of socially appropriate behaviour in their children

(Davidov & Grusec, 2006; Spinrad et al., 2007). For example, sensitive mothers were more likely to monitor their children's environment to ensure that the situational demands were developmentally appropriate and to provide support and comfort when their children were distressed. In contrast, mothers who were intrusive or controlling tended to exacerbate their child's poor regulatory skills (e.g., increased negativity) by making it more difficult for their children to manage their behaviour and emotional reactions (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002). Using measures of mothers' verbal and physical approvals, critical statements, hostility, warmth and punitiveness, Gilliom and colleagues (2002) underlined the role of maternal narratives and parenting behaviour in young boys' social behaviour. However, these were assessed by creating frustrating and upsetting experimental circumstances to observe how mothers and their children would respond. Thus, developing a research tool that would allow us to explore how mothers think about, concentrate on and speak to their children without exposing the children directly to distressing situations could represent a methodological advantage.

To explore the quality of mothers' relationship with their children, researchers have often used interviews and open-ended queries, wherein mothers were asked to describe their children and their relationship. The advantages were that the children were not directly exposed to potentially distressing situations and these maternal descriptions could be rated for different components, according to the protocol used. The most established tool to examine these maternal narratives and their association with children's intellectual and social ability is expressed emotion (EE: Brown & Rutter, 1966). EE's underlying assumption is that the way parents talk about a child, including the content of their descriptions and the tone of voice used, is indicative of the way they relate to the child on a daily basis (Chambless, Bryan, Aiken, Steketee, & Hooley, 1999; Hastings & Lloyd, 2007). Studies have shown that high maternal EE, generally characterised by narratives tainted by increased criticism, hostility and emotional over-involvement, represent a risk for the children's intellectual development (Beck, Daley, Hastings, & Stevenson, 2004; Greenberg, Seltzer, Hong, & Orsmond, 2006; Hastings, Daley, Burns, & Beck, 2006). Research investigating differences in the maternal descriptions of siblings, one with intellectual disability and one without,

in which intellectual disability was defined by severe developmental delay, caused mostly by Down syndrome, autism or cerebral palsy, indicated significant differences in the mothers' EE related to the children and their level of satisfaction with their parenting ability (Beck et al., 2004). Mothers were found to be more negative towards their child with intellectual disability for all domains of EE except dissatisfaction. Another study investigating the impact of EE on adolescents and adults with intellectual disability suggested that mothers with narratives indicating emotional over-involvement had children with higher language impairment, whilst those with high criticism tended to have children with higher levels of behaviour problems (Greenberg et al., 2006). However, the findings of these studies should be interpreted cautiously for two reasons. First, the increased rates of behaviour problems found to occur more frequently in children with intellectual disability could have affected their results. Second, the added stress of parenting children and adolescents with intellectual disability could have influenced their mothers' narratives and accounted partially for the dissatisfaction and criticism emerging from the narratives. Finally, their findings may not be generalised to young children, as one study (Greenberg et al., 2006) researched adolescents and adults, whilst the other (Beck et al., 2004) examined siblings between the ages of 4 and 14 years-old. Both studies did not account for age and gender differences within each sibling pair and, therefore, it is not possible to determine whether their results could be applied to their sample irrespectively of the children's age and gender. These differences need to be taken into account, in particular, because evidence suggests that the association between children's reading ability and antisocial behaviour was substantially more common in boys (Trzesniewski et al., 2006). Boys also tended to have higher rates of reading disability (Rutter et al. 2004),

Studies of monozygotic twins have tried to address some of these concerns by studying differences between twins, who are growing up in the same family and are identical in genetic makeup, age and sex, to provide evidence that children growing up in the same family are different from each other for environmental reasons. Researches using twin design have identified that differential maternal EE, more specifically harsh parental discipline increased the

risk of children's antisocial behaviour; whilst negative parental feelings were associated to social maladjustment, hyperactivity and conduct problems (Asbury, Dunn, Pike, & Plomin, 2003; Plomin et al., 2008). These results were substantiated by the fact that: (1) maternal EE was associated with both mothers' and teachers' ratings of children's behaviour problems; (2) these associations remained after controlling for children's earlier antisocial behaviour and (3) differences in maternal EE predicted differences between genetically identical MZ twins (Caspi et al., 2004). Therefore, differences in maternal EE reliably predicted differences in the antisocial behaviour of genetically identical children.

Evidence has been accumulating that children's intellectual development and social ability are influenced by differences in maternal narratives, based on the content of their descriptions and the tone of voice used, as captured by the EE codes. However, there are other aspects of maternal narratives, not yet assessed by the EE, including how mothers organize and structure their descriptions of their children, which could also have an effect on their intellectual and social ability. However, there is no narrative measure to date that is able to extract structural aspects of maternal narratives based on their descriptions of their children.

The interview protocol most commonly used to examine structural features of parents' narratives is the Adult Attachment Interview (AAI: George et al., 1985). The AAI, similar to the EE, aims to predict the quality of the parent-child relationships but it focuses on the parents' own experiences of attachment rather than on descriptions of their children. Another difference is that the AAI explores the structure of their narratives, particularly the coherence, clarity and consistency of their speech, whilst the EE aims to measure primarily the content of the narratives and the tone of voice (e.g. warmth and hostility). Similarly to findings derived from the EE, the assessment of the parent-children relationship using AAI indicated that mothers whose narratives were coherent and reflective were more likely to have children who were able to acknowledge distress and elaborate a coping strategy in a narrative completion task (Steele et al., 2002). Importantly, these associations remained after controlling for concurrent parenting styles, children's verbal

intelligence and the infant–parent attachment styles, indicating that how mothers structured their narratives, when describing their early attachment experiences, relates to children's different levels of social awareness and behaviour.

Although maternal narratives have contributed to a better understanding of the associations between parenting and the development of children's intellectual and social ability, the direction of these associations is debated, as cross-sectional studies cannot establish temporal priority. For example, previous findings suggesting that maternal narratives influence children's cognitive development cannot exclude the alternative hypothesis that children's cognition may also affect maternal narratives. Whilst research on intellectual disability has indicated that maternal narratives were more child-driven because they seemed to respond to the children's level of behavioural difficulty (Beck et al., 2004; Greenberg et al., 2006), longitudinal studies suggested that children's cognitive development and, in particular, their social cognition were influenced and shaped by the maternal narratives (Steele et al., 2002). However, these studies did not examine whether the associations between children's cognitive development and maternal narratives were due to environmentally mediated reasons or due to genetic factors. Consequently, questions remain as to whether maternal narratives shape children's cognitive development, or whether problematic and negative maternal narratives are elicited by more challenging children.

This study explores whether the maternal scales influence children's intellectual and social ability or whether children with cognitive difficulties evoke more convoluted and distorted maternal narratives. Based on a longitudinal design and the new maternal scales, this present study can make a contribution to currently existing research by exploring structural aspects of maternal narratives and their association with children's intellectual ability and social cognition without directly exposing young and at-risk children to potentially high levels of stress and using short and easily obtainable speech samples of mothers' descriptions of their children.

6.2 Aims and Objectives

First, this study aimed to further investigate the construct validity of the newly designed maternal scales by examining the association between the structural features of the maternal narratives and separate measures of children's intellectual and social abilities. Second, this chapter aimed to investigate whether the maternal scales influence children's intellectual and social ability or whether children's deficient intellectual and social development evoke more convoluted and distorted narratives. These latter investigations aimed to contribute to the existing controversy over the direction of the associations found between maternal narratives and children's cognitive development. Thus, for example, if the association found between maternal scales and children's intellectual development remained, even after controlling for children's previous intellectual development, this would suggest that the direction of the association was from maternal scales to children's intellectual development, because the children's previous intellectual development was not enough to explain by itself the association found between maternal scales and children's intellectual ability. I expect that the new maternal scales to be related to children's intellectual and social ability and children's cognitive and social development to be influenced by the structural aspects of maternal narratives. Additionally, I expect that to a lesser extent children's abilities would also influence their mothers' descriptions.

6.3 Methods and measures

Participants were members of the Environmental-Risk (E-Risk) Longitudinal Twin Study, which follows the development of 2,232 same-sex twins drawn from a larger 1994-1995 birth register of twins born in England and Wales (Trouton et al., 2002). Children participated in home-visit assessments when they were 5-years-old and again when their children were aged 7 (98% response rate, N= 2,191), 10 (96%, N= 2,143) and 12 years (96%, N= 2,143). Sex was evenly distributed in this sample (48 % male). Details of the sample construction are reported in chapter 2.

6.3.1 Measures of children's development

A selection of different measures of children's intellectual ability and social behaviour were chosen to summarize children's development. This choice was influenced by three factors. First, development is such a vast area of study that I decided to narrow it down to two complementary domains of children's functioning: intellectual ability and social behaviour. Second, I wanted to investigate how maternal narratives relate to children's ability to think and act in a goal directed and adaptive ways within various domains of functioning, including their 1) verbal ability, which refers to their capacity to use language, including reading and writing skills, 2) problem-solving ability, including their ability to analyze of a problem, correctly interpret relevant information and use logical reasoning skills, and 3) social competence, such as their ability to accurately interpret others' emotional states, make accurate social judgments and respond adequately. Together these three different components could be informative of how children use their cognitive ability between different but complementary areas of functioning.

Thirdly, as previous research had suggested that there might be an association between these distinct areas of children's cognitive development (Trzesniewski et al., 2006), testing whether the new scales would be consistently associated across these different domains of children's cognition could further our investigation on the construct validity of the maternal scales.

6.3.1.1 Measures of children's intellectual ability

Children's intellectual abilities were examined using four different measures: (1) reading scores; (2) intellectual coefficient (IQ); (3) academic performance on English and (4) academic performance on Mathematics. Reading and IQ tests were completed by the children themselves, whilst the children's teachers reported on their academic performances at school. This study used measures of children's academic performances to assess their ability to retain, process and retrieve the information taught and perform within the school environment.

Reading Abilities were tested at age 10. Children were administered the Test of Word Reading Efficiency (TOWRE) (Torgesen, Wagner, & Rashotte, 1999). The TOWRE measures children's ability to recognise whole words and pronounce them quickly and accurately and their ability to sound out unfamiliar words. The TOWRE contains two subtests. The Sight Word Efficiency subtest measures the number of real words that the child correctly pronounces in 45 seconds from a total list of 104 words. The Phonemic Decoding Efficiency subtest measures the number of non-words the child correctly pronounces in 45 seconds from a list of 63 words. There are two versions of each subtest. At age 10, only the Sight Word Efficiency subtest was administered. The TOWRE examiners manual (Torgesen et al, 1999) provides information about converting the child's raw score to age-based standard scores and tables of norms.

To administer the TOWRE reading test, research workers first used an initial practice list of 8 relatively easy words to familiarise the child with the test. Children were asked to read as many of the 8 practice words as they could. Next, the research worker described the task to the child and used a demonstration list of 53 words to show the child what the real word list would look like, where to begin reading, and in which direction to read. Lastly the child was shown the real word list of 104 words and asked to begin reading. The research worker started timing 45 seconds from when the child said the first word. If the child began reading the list incorrectly, across instead of down, for example, the research worker would stop them straight away, clarify the instructions and then restart the child at the beginning of the list. If this happened further along during the test, the research worker was instructed to let the child proceed and not restart the whole test. Research workers were required to mark any words that are read incorrectly or skipped on their coding sheet. At the end of 45 seconds, they marked the word the child got up to on the list. The raw score was the number of words read correctly in 45 seconds. During pilot testing, 10-year-old children at a local school were administered the same reading list and many were able to read through to almost the end of the word list. The E-Risk team subsequently decided to include all 104 words from the Sight Word Efficiency subtest at phase 10 so that we would be able to score children who were in the top percentiles of reading ability. The words

started out quite easy (e.g. is, up, cat) but they got harder as children went along (e.g. property, distress, information). The conversion from raw scores to age-based standard scores was based on instructions found in the TOWRE's Examiner's Manual (1999). The scores ranged from 54 to 139 (M = 99.85, SD = 13.56).

Children's IQ was tested when they were 5 years during home visits using a short form of the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI; Wechsler, 1990) using the Vocabulary and Block Design subtests. Children's IQ was prorated following procedures described by Sattler (1992). Children's scores ranged from 55 to 145 (M = 95.63, SD = 14.78) in this study subsample. Children's IQ was assessed again when they were 12 years old. Children's IQ was derived from a sum of the Matrix Reasoning and Information subtests, which were afterwards converted to IQ, abiding again to the criteria established by Sattler. Scores ranged from 48 to 140 (M = 92.46, SD = 14.14).

Academic performances in English and Maths were collected from teachers' reports. Questionnaires were sent out by post to the children's teachers directly at the schools when the participants were 10 and 12 years old. Teachers were asked to compare the children to typical pupils of the same age on English and Maths academic performance, responding whether the child was (1) far below average, (2) somewhat below average, (3) average, (4) somewhat above average and (5) far above average. Response rates for the evaluation of English performance were 90% and 77% at ages 10 and 12, while the response rates for Maths performance were 89% and 67% at 10 and 12 years. English academic performance ranged from 0 to 4 (M = 1.93, SD = .03) at age 10 and from 0 to 4 (M = 2.12, SD = .03) at age 12 in this sample. Maths academic performance ranged from 0 to 4 (M = 1.98, SD = .03) at age 10 and from 0 to 4 (M = 2.11, SD = .03) at age 12.

6.3.1.2 Measures of children's social ability

Children's social competence was assessed using two separate measures of social behaviour: (1) prosocial behaviour and (2) social problems, both reported by their mothers and teachers. These characteristics were chosen based on evidence suggesting that children's ability to read social situations accurately and behave appropriately in social circumstances were useful indicators of children's social cognition (Ziv, Oppenheim, & Sagi-Schwartz, 2004). For example, aggressive children were found to be less attentive to social stimulation (Dodge & Tomlin, 1987), less accurate in their interpretation of their peers' social intentions (Dodge, Bates, & Pettit, 1990; Dodge, Pettit, & Bates, 1994), most likely to generate aggressive or inept responses (Webster-Stratton & Lindsay, 1999; Dodge, Pettit, Bates, & Valente, 1995) and to expect positive instrumental and interpersonal outcomes for an aggressive response (Crick & Ladd, 1990). Research has also suggested that children's ability to process social information should be regarded as domain-specific construct, as it may vary across different social environments and, for this reason, it should be measured across different social areas (Ziv et al., 2004). Based on these findings, mothers' and teachers' independent reports were used to take into consideration any discrepancy within the children's behaviour across the two main social environments of their daily routine (e.g. home and school).

Prosocial behaviour was measured using mothers' and teachers' reports when children were 5, 10 and 12 years-old using 10 items from the Revised Rutter Parent Scale for School-Age Children (Sclare, 1997). Mothers were given the instrument as a face to face interview and teachers were sent out questionnaires by post. Both informants rated each item, such as '*Tries to stop quarrels or fights',* '*Tries to be fair in games'* and '*Considerate of other people's feelings'*, as being *not true* (0), *somewhat* or *sometimes true* (1), or *very true* or *often true* (2). This scale is the sum of the items reported by mothers and teachers and ranged from 7 to 40 (M = 27.98, SD = 6.07) at age 5, from 7 to 40 (M = 30.80, SD = 5.75) at age 10 and from 3 to 40 (M = 28.93, SD = 5.65) at age 12. The internal consistency reliabilities of the mothers reports for children's prosocial behaviour were respectively .76 at age 5; .77 at age 10 and .79 at age 12, whilst the

internal consistency reliabilities of the teachers' reports were .92 at age 5; .92 at age 10 and .93 at age 12.

Social problems were assessed using mothers' and teachers' reports when children were 5, 10 and 12. It used the sum of the five items drawn from the Achenbach family of instruments for the mothers and three items for the children's teachers (CBCL; Achenbach, 1991b; Achenbach, 1991c). Items included *'Doesn't get along with other children', 'Gets teased a lot'* and *'Not liked by the other children'.* The Social Problems Scale ranged from 0 to 4.5 (M = .37, SD = .63) at age 5, from 0 to 9 (M = 1.24, SD = 1.47) at age 10 and from 0 to 9.5 (M = 1.20, SD = 1.41) at age 12. The internal consistency reliabilities for this scale were respectively .52 at age 5; .70 at age 10 and .70 at age 12 for mothers and .60 at age 5; .83 at age 10 and .80 at age 12 for teachers.

6.3.2 Statistical analyses

Before examining the associations between the maternal scales and children's measures of intellectual and social ability, I used Pearson correlations to test whether these children's measures were related. More specifically, these preliminary analyses aimed to establish whether these measures were tapping into similar features of children's intellectual ability and social behaviour respectively and, across the two groups of measures to confirm they were capturing distinct but related aspects of children's functioning.

I conducted the analyses on the associations between the maternal scales and children's intellectual and social ability in four steps. First, I explored whether the maternal scales, collected when the children were age 10, were associated to concurrent measures of children's intellectual and social ability by examining the magnitude of the relationship between these variables. I used Spearman correlations because the data on the maternal scales were ordinal and not normally distributed.

Second, I investigated whether the maternal scales would remain associated to the measures of children's intellectual and social ability, after controlling for the potential confounding effect of children's gender and socio-economic deprivation. For these analyses, linear regression models were used, given that all the outcome variables in this study were continuous. I tested these associations for each maternal subscale separately in models 1 and 2 and, in the final regression model, I included both Descriptive Reasoning and Relevance subscales to investigate the presence of suppression effect, as described in previous chapters. I expected that the maternal scales would be related to measures of children's intellectual and social ability and that these associations would remain after controlling for children's gender and levels of socio-economic deprivation experienced by their families.

Third, to verify whether the associations between maternal scales and children's intellectual and social abilities could be generalized to boys and girls growing up in families of distinct socio-demographic status, I derived four interaction terms between each maternal scales and gender or SES disadvantage (e.g., Relevance x SES) and tested the moderating effects of these socio-demographic variables on the association between maternal scales and the measures for children's intellectual and social ability. Regression analyses were adjusted for gender, SES disadvantage and other maternal scales to account for any possible suppression effect.

Fourth, I tested whether the observed associations between the maternal scales and concurrent measures of children's intellectual and social abilities remained after controlling for individual differences at ages 5 and 10 by including these variables in the previous regression models. My aim was to examine whether the predictive value of the associations was over and above the concurrent associations. For children's intellectual ability, the association between the maternal scales and children's (1) IQ at age 12 was controlled for IQ at age 5, (2) English and (3) Mathematics academic performance at age 12 were controlled for previous English and Mathematics academic performance at age 10. For children's social ability, the associations

between the maternal scales and children's prosocial behaviour and social problems at ages 10 and 12 were investigated, whilst controlling for initial differences at age 5.

Statistical analyses were complicated by the fact that the E-Risk Study contained two children per family. The data was then clustered to compute adjusted standard error estimates and correct for the non-independence of observations using STATA 9.0 (StataCorp, 2005).

6.4 Results

Results are presented in four parts. First, I tested whether the maternal scales were associated with children's intellectual and social ability. Second, I documented whether these associations would remain after taking into account gender and socio-economic deprivation. Third, I tested whether our findings applied to our whole sample irrespective of the children's gender or socio-economic deprivation. Fourth, I explored whether the association between maternal narratives and children's measures would remain despite earlier individual differences.

6.4.1 Maternal scales and children's intellectual and social abilities at ages 10 and 12

Table 6.1 presents the associations between measures of intellectual and social abilities. Results showed that most measures of children's intellectual ability were strongly associated to each other. Conversely, measures of children's social cognition were weakly associated to one another. Most indicators measured prospectively at ages 10 and 12 were highly correlated, possibly reflecting the stability of these measures over time. Moreover, indicators of children's intellectual ability were weakly associated with social cognition variables, suggesting that these two groups of factors measured different aspects of children's cognition.

Table 6.1: Pearson Correlations between Measures of Children's Cognitive Abilities and Social Cognition

	Cognitive ability						- Social cognition		
	Reading	IQ	English		Maths		Prosocial		Social Problems
	Age 10	Age 12	Age 10	Age 12	Age 10	Age 12	Age 10	Age 12	Age 10
Cognitive ability									
IQ age 12	.51***								
English									
Age 10	.66***	.59***							
Age 12	.56***	.51***	.63***						
Maths									
Age 10	.56***	.62***	.81***	.56***					
Age 12	.53***	.57***	.62***	.83***	.63***				
Social ability									
Prosocial behaviour									
Age 10	.08***	.06*	.18***	.19***	.12***	.16***			
Age 12	.07**	.10***	.16***	.25***	.09***	.21***	.45***		
Social Problems									
Age 10	-.12***	-.13***	-.21***	-.20***	-.22**	-.19***	-.34***	-19***	
Age 12	-.14***	-.16***	-.22***	-.24***	-.19**	-.23***	-.21***	-.33***	.33***

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

6.4.1.1 Maternal scales and children's intellectual ability at ages 10 and 12

Here, the findings for steps 2 to 4 for children's intellectual ability are presented. A summary of the association between the maternal scales and indices of the children's cognitive ability is presented in the Table 6.2. Descriptive Reasoning was associated to all six measures of children's cognition at ages 10 and 12, with the strongest association to children's IQ at age 12. These findings indicated that mothers with coherent, reflective and open narratives were more likely to have children with high cognitive ability. Relevance, however, was not significantly associated with any of these six measures of children's intellectual ability.

Table 6.2: Spearman Correlations between Maternal Scales and Children's Intellectual Ability at Ages 10 and 12

	Reading Age 10	IQ Age 12	English Age 10	English Age 12	Maths Age 10	Maths Age 12
Descriptive Reasoning	.17***	.31***	.19***	.14***	.19***	.17***
Relevance	-.01	.07*	.02	.01	.00	.04

Note. * $p < .05$; *** $p < .001$.

These correlations were further supported by regression analyses. Table 6.3 (models 1 and 2) shows the associations between each maternal scale and children's cognitive abilities, controlling for the confounding effects of gender and socio-economic deprivation. Descriptive Reasoning was significantly associated with four measures of children's intellectual ability. Relevance was not associated to children's cognitive abilities. When both maternal scales were simultaneously entered into the regression model previous findings remained; Descriptive Reasoning was associated with all measures of children's cognitive abilities with the exception of Maths at age

12, whilst Relevance was not. In sum, mothers with coherent, reflective and open narratives tended to have children with high intellectual ability at ages 10 and 12.

Table 6.3: Regression Analyses for Association between the Maternal Scales and Children's Intellectual Abilities at Ages 10 and 12

	Reading scores Age 10			IQ Age 12			English Age 10			English Age 12			Maths Age 10			Maths Age 12		
	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2	B	S.E.	R^2
Descriptive Reasoning	.50	.28	.06	1.10***	.24	.17	.05*	.02	.09	.04	.02	.06	.05**	.02	.07	.04*	.02	.06
Relevance	-.06	.85	.06	.80	.71	.15	.01	.06	.08	.03	.06	.05	-.00	.05	.06	.05	.06	.08
Descriptive Reasoning	.60*	.29	.06	1.19***	.26	.17	.05*	.02	.09	.04*	.02	.06	.06***	.02	.07	.04	.02	.06
Relevance	-.83	.90		-.69	.76		-.06	.06		-.02	.06		-.08	.06		.00	.07	

Note. Results were adjusted for gender and socio-economic deprivation. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6.4 presents the interaction effects between the maternal scales and gender or SES disadvantage in relation to children's cognitive ability. Overall, these results indicate that most associations between the maternal scales and children's intellectual ability could be generalised to the whole sample, irrespectively of gender or SES disadvantage. However, one significant interaction emerged between Descriptive Reasoning and gender in relation to children's reading scores (Table 6.4). This finding would suggest that the association between mothers' Descriptive Reasoning scores varied according to children's gender. Nevertheless, considering that many interaction tests were conducted, there is a possibility that this one result was a chance finding.

Table 6.4: Summary for Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Cognitive Abilities at Ages 10 and 12

Reading scores age 10	*B*	S.E.	R^2
Gender	12.76*	3.67	.07
Descriptive Reasoning	2.76*	.79	
Interaction D.R. x Gender	-1.45*	.48	
Gender	6.75	3.73	.06
Relevance	2.51	2.82	
Interaction Relevance x Gender	-2.22	1.66	
SES disadvantage	-1.91	1.05	.06
Descriptive Reasoning	.44	.43	
Interaction D.R. x SES disadvantage	.07	.14	
SES disadvantage	-.85	1.15	.06
Relevance	-.38	1.36	
Interaction Relevance x SES disadvantage	-.26	.51	
IQ age 12	*B*	S.E.	.17
Gender	-1.67	3.17	
Descriptive Reasoning	-.69	.76	
Interaction D.R. x Gender	-.14	.43	
Gender	-3.76	3.07	.17
Relevance	-1.40	2.35	
Interaction Relevance x Gender	.47	1.37	
SES disadvantage	-1.90*	.89	.17
Descriptive Reasoning	1.35***	.39	
Interaction D.R. x SES disadvantage	-.07	.77	
SES disadvantage	-1.83	.95	.17
Relevance	-.24	1.14	
Interaction Relevance x SES disadvantage	-.26	.42	

Table 6.4: Summary for Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Cognitive Abilities at Ages 10 and 12 (Cont. 1)

English Performance age 10	*B*	S.E.	R^2
Gender	.50	.28	.09
Descriptive Reasoning	.10	.59	
Interaction D.R. x Gender	-.03	.04	
Gender	.31	.25	.09
Relevance	-.02	.19	
Interaction Relevance x Gender	-.03	.11	
SES disadvantage	-.12	.07	.08
Descriptive Reasoning	.05	.03	
Interaction D.R. x SES disadvantage	.00	.01	
SES disadvantage	-.09	.08	.08
Relevance	-.04	.08	
Interaction Relevance x SES disadvantage	-.01	.03	
Maths Performance age 10	*B*	S.E.	.07
Gender	.18	.26	
Descriptive Reasoning	.10	.06	
Interaction D.R. x Gender	-.03	.03	
Gender	.30	.25	.07
Relevance	.16	.19	
Interaction Relevance x Gender	-.16	.11	
SES disadvantage	-.14*	.07	.07
Descriptive Reasoning	.05	.03	
Interaction D.R. x SES disadvantage	.00	.01	
SES disadvantage	-.10	.08	.07
Relevance	-.08	.08	
Interaction Relevance x SES disadvantage	-.00	.03	

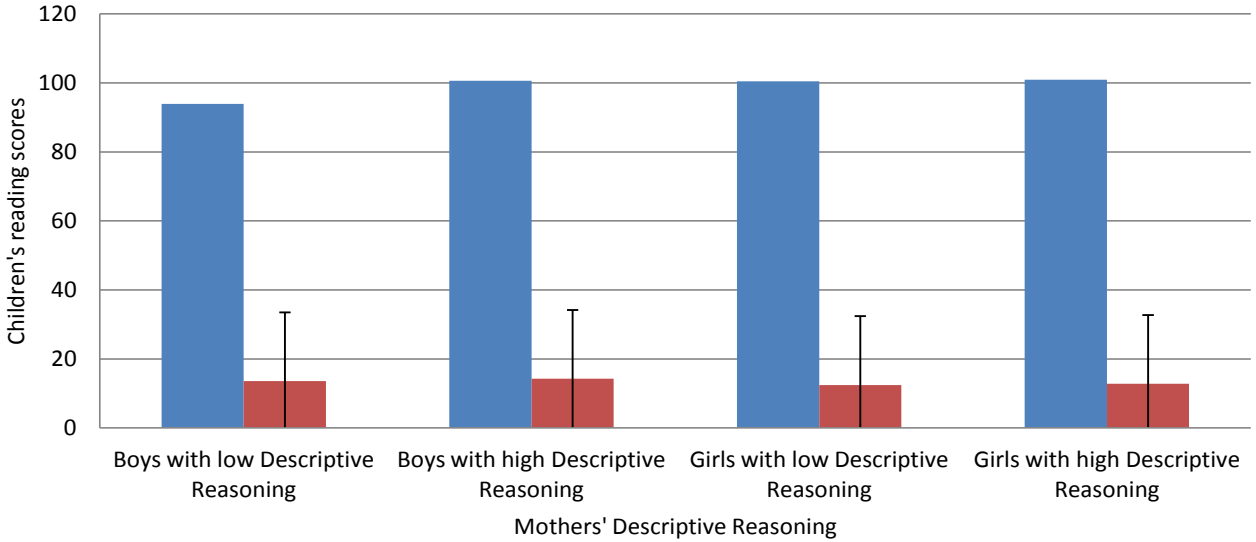
Table 6.4: Summary for Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Cognitive Abilities at Ages 10 and 12 (Cont. 2)

English Performance age 12	*B*	S.E.	R^2
Gender	.36	.31	.06
Descriptive Reasoning	.07	.07	
Interaction D.R. x Gender	-.02	.04	
Gender	.35	.27	.06
Relevance	.04	.20	
Interaction Relevance x Gender	-.06	.12	
SES disadvantage	-.15*	.08	.06
Descriptive Reasoning	.02	.03	
Interaction D.R. x SES disadvantage	.01	.01	
SES disadvantage	-.05	.08	.06
Relevance	.00	.09	
Interaction Relevance x SES disadvantage	-.01	.04	
Maths Performance age 12	*B*	S.E.	.06
Gender	.08	.31	
Descriptive Reasoning	.05	.07	
Interaction D.R. x Gender	-.00	.04	
Gender	.13	.29	.06
Relevance	.06	.22	
Interaction Relevance x Gender	-.04	.13	
SES disadvantage	-.21*	.08	.07
Descriptive Reasoning	.01	.03	
Interaction D.R. x SES disadvantage	.01	.01	
SES disadvantage	-.12	.09	.06
Relevance	-.02	.10	
Interaction Relevance x SES disadvantage	.01	.04	

Note. Results have been adjusted for gender, SES disadvantage and other maternal scales. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

Further investigation of this significant interaction, using one way Anova, indicated that girls' reading performance were not affected by their mother's scores on Descriptive Reasoning ($F=0.27$, $p=0.60$), whereas the boys' reading ability were negatively affected by mothers' poorer narrative construction characterized by lower levels of coherence, reflectiveness and openness ($F=16.14$, $p=0.000$). Figure 1 shows that boys' reading scores were lower for those whose maternal narratives were rated the lowest scores for Descriptive Reasoning (scores of 0 and 1), in comparison to those whose maternal narratives were rated the highest scores for Descriptive Reasoning (scores of 2 and 3). This difference in reading scores was not observed between the two groups of girls.

Figure 1: Means for children's reading scores at age 10 according to gender and Descriptive Reasoning



To investigate whether the predictive value of the maternal scales on children's intellectual ability remained after accounting for children's earlier individual differences, I used longitudinal data. These analyses were not conducted for Relevance, as this scale was not related to children's intellectual abilities. Additionally, I was unable to conduct these analyses using data on children's reading at age 5, because the E-Risk Study did not collect a measure of reading ability at age 5.

First, to test whether the predictive association of Descriptive Reasoning on children's IQ at age 12 would remain over and above the children initial differences I controlled this for children's earlier intellectual ability at age 5. Results indicate that Descriptive Reasoning remained significantly associated with children's IQ at age 12 after controlling for the children's IQ scores at age 5 (Table 6.5). This finding suggests that mothers with more coherent, reflective and open narratives have children with increased IQ at age 12 over and above initial differences in the children's intellectual ability at age 5.

The predictive value of Descriptive Reasoning on children's English academic performance at age 12 was lost after controlling for their concurrent performance at age 10. This suggests that mothers' level of coherence, reflection and openness captured by the maternal scale were unrelated to children's English performance after taking into account individual differences at age 10. Consistently, the association between Descriptive Reasoning and academic performance on Mathematics at age 12 was also lost when considering children's previous performance at age 10. These results suggest that maternal scales could have a spurious effect on children's academic performance, as the new scales do not have a direct casual connection to children's achievement in both English and Maths.

Table 6.5: Associations between Maternal Scales and Children's Intellectual Ability at Age 12, Controlling for Measures at Age 5 or 10

IQ at age 12 (N=1024*[1])	*B*	S.E.	R^2
Descriptive Reasoning	.68***	.20	.33
IQ at age 5	.41***	.03	
English at age 12 (N=729*[2])			
Descriptive Reasoning	.02	.01	.38
English age 10	.52***	.03	
Maths at age 12 (N=637*[3])			
Descriptive Reasoning	.03	.01	.39
Maths age 10	.55***	.03	

Note. Results have been adjusted for gender and SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. *[1] 26 children missing. *[2] 321 children missing. *[3] 413 children missing. * $p < .05$; ** $p < .01$; *** $p < .001$.

6.4.2 Maternal scales and children's social cognition at ages 10 and 12

Table 6.6 shows the coefficients for Spearman correlations for the associations between maternal scales and measures of children's social cognition at ages 10 and 12. Descriptive Reasoning was weakly but consistently related to prosocial behaviour and social problems indicating that mothers whose narratives were more coherent, reflective and open had children with higher prosocial behaviour and fewer social problems at ages 10 and 12. No significant associations were detected between Relevance and prosocial behaviour or social problems.

Table 6.6: Spearman Correlations between Maternal Scales and Children's Social Cognition at Ages 10 and 12

	Prosocial behaviour		Social Problems	
	Age 10	Age 12	Age 10	Age 12
Descriptive Reasoning	.13*	.08*	-.09*	-.14*
Relevance	.06	.01	.05	.02

Note. * $p < .05$.

To test further these associations, it was investigated whether they remained when controlling for gender and SES disadvantage (Table 6.7). Consistent with previous correlations, Descriptive Reasoning was positively associated with prosocial behaviour at ages 10 and 12, and negatively related to social problems at age 12. Relevance was not associated to any measures of children's social ability. When Descriptive Reasoning and Relevance were included in the same regression models, Relevance became negatively significantly associated with children's prosocial behaviour at age 12 and positively related to social problems at ages 10 and 12. These indicate that when the maternal scales were integrated in the same regression equation, they seemed to increase each other's association to the outcome variables by enhancing Relevance's contribution to the children's prosocial behaviour and social problems at age 12. These could indicate the presence of suppression effect. These results also indicate that mothers with higher scores on the Relevance scale have children with lower prosocial behaviour. Thus, mothers whose narratives were coherent, reflective and open, but not relevant, tended to have more socially adjusted children.

Descriptive Reasoning and Relevance were not associated to measures of children's social problems at age 10 on their own. However, when the maternal scales were combined into the same regression model, they became associated to this outcome variable. To test for a moderation effect between the two scales on children's social problems at age 10, which could

explain the suppression effect, I derived one interaction term between the maternal scales (e.g. Descriptive Reasoning x Relevance). Regression analyses were adjusted for the maternal scales. No interaction effect was found between the maternal scales on children's social problems at age 10 (B=.03, S.E.=07, p=0.17). Accordingly, mothers whose narratives were more coherent, reflective, open but not very relevant have children with significantly less social problems.

Results seemed to indicate that the maternal scales' association to children's social problems became stronger at both ages 10 and 12 when they were combined. The difference in regression coefficient for Descriptive Reasoning (r=-.07 and r_1=-.09) and Relevance (r=.05 and r_1=.17) is consistent with a suppression effect. Therefore, mothers whose narratives were rated high for Descriptive Reasoning, but not for Relevance, seemed to have children with less social problems consistently at ages 10 and 12.

No significant interactions were found between the maternal scales and gender or SES deprivation on prosocial behaviour and social problems (Table 6.8).

Table 6.7: Summary for Regression Analysis Measuring Association between Maternal Scales and Children's Social Ability

	Prosocial behaviour						Social problems					
	Age 10			Age 12			Age 10			Age 12		
	B	S.E.	R^2	B	S.E.	R^2	B	S.E	R^2	B	S.E.	R^2
Descriptive Reasoning	.43***	.11	.14	.26**	.09	.11	-.04	.03	.04	-.07*	.03	.04
Relevance	.37	.31	.12	-.23	.12	.10	.10	.08	.05	.05	.08	.04
Descriptive Reasoning	.46***	.12	.14	.35**	.10	.12	-.06	.03	.05	-.09**	.03	.05
Relevance	-.22	.12		-.67*	.34		.18**	.08		.17*	.08	

Note. Results have been adjusted for gender and SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6.8: Summary for Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Social Cognition at Ages 10 and 12

Prosocial Behaviour Age 10	*B*	S.E.	R^2
Gender	5.31***	1.57	.14
Descriptive Reasoning	.74*	.33	
Interaction D.R. x Gender	-.19	.20	
Gender	4.10 ***	1.34	.14
Relevance	-.08	1.00	
Interaction Relevance x Gender	-.09	.60	
SES disadvantage	-.26	.35	.14
Descriptive Reasoning	.38*	.17	
Interaction D.R. x SES disadvantage	.04	.05	
SES disadvantage	.13	.37	.14
Relevance	-.10	.41	
Interaction Relevance x SES disadvantage	-.06	.17	
Prosocial Behaviour Age 12	*B*	S.E.	R^2
Gender	3.78***	1.35	.11
Descriptive Reasoning	.39	.27	
Interaction D.R. x Gender	-.03	.17	
Gender	1.50	1.23	.11
Relevance	-2.10*	.88	
Interaction Relevance x Gender	.95	.56	
SES disadvantage	-.34	.34	.11
Descriptive Reasoning	.26	.15	
Interaction D.R. x SES disadvantage	.04	.04	
SES disadvantage	.08	.37	.11
Relevance	-.55	.42	
Interaction Relevance x SES disadvantage	-.07	.17	

Table 6.8: Summary for Interaction Effects between Maternal Scales, Gender and SES Disadvantage on Children's Social Cognition at Ages 10 and 12 (Cont.)

Social Problems Age 10	*B*	S.E.	R^2
Gender	-.24	.47	.05
Descriptive Reasoning	-.06	.10	
Interaction D.R. x Gender	.00	.06	
Gender	-.23	.36	.06
Descriptive Reasoning	-.06*	.03	
Interaction Relevance x Gender	.00	.16	
SES disadvantage	.36***	.12	.05
Descriptive Reasoning	.01	.04	
Interaction D.R. x SES disadvantage	-.03	.01	
SES disadvantage	.10	.10	.05
Relevance	.14	.10	
Interaction Relevance x SES disadvantage	.02	.04	
Social Problems Age 12	*B*	S.E.	R^2
Gender	-.68	.47	.06
Descriptive Reasoning	-.17	.10	
Interaction D.R. x Gender	.05	.06	
Gender	.20	.34	.06
Relevance	.53*	.24	
Interaction Relevance x Gender	-.24	.15	
SES disadvantage	.27*	.13	.06
Descriptive Reasoning	-.04	.04	
Interaction D.R. x SES disadvantage	-.25	.02	
SES disadvantage	.10	.11	.06
Relevance	.17	.10	
Interaction Relevance x SES disadvantage	-.00	.05	

Note. Results have been adjusted for gender, SES disadvantage and other maternal scales. *B* = Coefficient and *S.E.* = Standard Error. * $p < .05$; *** $p < .001$.

To test whether the associations between maternal scales and measures of children's social cognition remained after controlling for the children's previous scores at age 5, linear regression models were used (Table 6.9). Because previous findings showed a suppression effect between Descriptive Reasoning and Relevance on children's social cognition, both maternal scales were added in the model. Descriptive Reasoning remained significantly associated to children's prosocial behaviour at ages 10 and 12, even after controlling for earlier scores at age 5. These findings indicated that mothers whose narratives were more coherent, reflective and open were significantly more likely to have children who were prosocial at ages 10 and 12, even after taking into account their initial differences at age 5. The association between Relevance and children's prosocial behaviour at age 12 became non significant after controlling for children's previous prosocial behaviour. This finding suggests that children's earlier measures of adjustment behaviour answered for the association between mothers' relevance level and children's later prosocial behaviour.

Earlier measures of social problems accounted for the association between maternal scales and children's social problems at age 10, as these associations were non-significant, after controlling for social problems at age 5. These findings indicate that children's early social problems at age 5 mediated the association between maternal scales and children's social problems at age 10, but not at age 12, as Descriptive Reasoning remained significantly associated to children's social problems at age 12 even after controlling for the children's previous scores for social problems at age 5.

To summarise, results showed that early measures of children's social problems accounted for the association found between maternal scales and children's social problems at age 10, but did not explain this association at age 12. These suggest that children's early social problems at age 5 affected the maternal narratives at age 10, which in turn shaped children's social problems at age 12. Thus, children's social problems seemed to be the product of dynamic interplay between the children and their environments, as earlier measures of children's social problems were

affected by later measures of maternal scales, just as earlier measures of maternal scales influenced later measures of children's social problems.

Table 6.9: Summary for Maternal Scales Association to Children's Prosocial and Social Problems at Ages 10 and 12, Controlling for Previous Scores at Age 5

Prosocial behaviour at age 10 (N=1050)			
	B	S.E.	R^2
Descriptive Reasoning	.36**	.12	.19
Relevance	-.09	.31	.18
Prosocial behaviour age 5	.23***	.03	.19
Prosocial behaviour at age 12 (N=1035*[1])			
	B	S.E.	R^2
Descriptive Reasoning	.24*	.10	.18
Relevance	-.52	.32	.18
Prosocial behaviour age 5	.26***	.03	.18
Social problems at age 10 (N=1048*[2])			
	B	S.E.	R^2
Descriptive Reasoning	-.04	.03	.14
Relevance	.10	.08	.14
Social problems age 5	.66***	.09	.14
Social problems at age 12 (N=1033*[3])			
	B	S.E.	R^2
Descriptive Reasoning	-.08*	.03	.11
Relevance	.11	.08	.11
Social problems age 5	.51***	.09	.11

Note. Results have been adjusted for gender and SES disadvantage; *B* = Coefficient and *S.E.* = Standard Error. *[1] 15 children missing. *[2] 02 children missing. *[3] 17 children missing. * $p < .05$; ** $p < .01$; *** $p < .001$.

6.4.3 Does EE mediate the associations between maternal scales and children's cognitive development?

Linear regression models were used to explore whether the associations found between the maternal scales and measures of children's cognitive development (i.e. IQ age 12, prosocial behaviour age 10 and 12 and social problems age 12) remained over and beyond the EE measures maternal warmth and negativity. The regression models include both maternal scales to account for the possibility of suppression effects previously reported on the maternal scales.

Table 6.10 shows that Descriptive Reasoning remained significantly associated with children's IQ at age 12 after both EE maternal warmth and negativity were included in the regression model. These findings suggest that the covariance between the maternal scale and the EE measures did not account for the association found between Descriptive Reasoning and children's IQ. Both Descriptive Reasoning and Relevance scales remained associated with children's prosocial behaviour at age 12, whilst only Descriptive Reasoning kept its association with prosocial behaviour at age 10, after controlling for EE warmth and negativity. Together, these findings suggest that the maternal scales are capturing distinct structural features of maternal narratives which are uniquely associated to children's cognitive development and social cognition over and above the EE codes. Descriptive Reasoning and Relevance scales are thus making an original and useful contribution to extend the scope of narrative research.

Table 6.10: Regression Analyses for Association between Maternal Scales and Children's Cognitive Development, Controlling for EE Measures at Age 10

IQ at age 12 (N=1029) *[1]	*B*	S.E.	R^2
Descriptive Reasoning	1.19***	.29	.17
Relevance	-.75	.82	
Maternal warmth	.15	.59	
Descriptive Reasoning	1.15***	.26	.18
Relevance	-.56	.81	
Maternal negativity	-.58*	.23	
Prosocial behaviour at age 10 (N=1050)	*B*	S.E.	R^2
Descriptive Reasoning	.29*	.12	.17
Relevance	-.19	.36	
Maternal warmth	1.16***	.24	
Descriptive Reasoning	.42***	.12	.19
Relevance	-.20	.34	
Maternal negativity	-.61***	.10	
Prosocial behaviour at age 12 (N=1033*[2])	*B*	S.E.	R^2
Descriptive Reasoning	.26*	.11	.13
Relevance	-.69*	.36	
Maternal warmth	.83***	.23	
Descriptive Reasoning	.35***	.11	.14
Relevance	-.68*	.35	
Maternal negativity	-.44***	.11	
Social problems at age 12 (N=870*[3])	*B*	S.E.	R^2
Descriptive Reasoning	-.09	.06	.05
Relevance	.24	.21	
Maternal warmth	-.22	.13	
Descriptive Reasoning	-.10	.06	.07
Relevance	.22	.20	
Maternal negativity	.19	.05	

Note. Results have been adjusted for gender and SES disadvantage. *B* = Coefficient and *S.E.* = Standard Error. *[1] 21 children missing. *[2] 17 children missing. *[3] 180 children missing. * $p < .05$; ** $p < .01$; *** $p < .001$.

6.5 Discussion:

The current study explored the construct validity of the newly designed maternal scales by examining links between the structural features of the maternal narratives and children's cognitive development, using separate measures of children's intellectual and social abilities.

Descriptive Reasoning was associated to concurrent and later measures of children's intellectual ability and these could not be explained by their levels of SES deprivation. Thus, mothers, whose narratives were coherent, reflective and open have children with higher IQ, higher reading ability and better academic performance at both English and Maths. This association remained after taking into account children's previous IQ scores, indicating that Descriptive Reasoning predicts children's later intellectual development over and above their earlier intellectual ability levels. These findings were consistent with previous research reporting that mothers, who provided coherent descriptions of their early parent-child relationships, were more likely to have children with higher IQ and that this association could not be explained by earlier IQ and family socio-economic status (Crandell & Hobson, 1999).

Furthermore, it has been well-documented that mothers who have a coherent way of thinking about their own attachment relationships tend to provide sensitive care for their children (van IJzendoorn, 1995), and cognitive research has linked sensitive parenting to children's higher IQ (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004) and better emergent literacy skills, irrespectively of their earlier degree of intelligence and preparatory reading instruction (Bus & Van IJzendoorn, 1988). However, Crowell and Feldman (1988) found that mothers, whose descriptions of their early attachment experiences were incoherent, idealized or disordered, had young children with both behavioural problems and cognitive delays. Additionally, previous findings indicated the clarity and coherence of the maternal narratives predicted their daughters' academic achievement in kindergarten over and above the effects of authoritative parenting and positive marital problem-solving behaviour (Cowan, Bradburn, & Cowan, 2005).

Thus, findings based on the maternal scales are consistent with previous literature, showing an association between structural aspects of mothers' descriptions of their early attachment experiences and young children's intellectual ability. This study, however, was the first to demonstrate that structural features of mothers' descriptions of their children were related to children's intellectual ability over and above their initial ability levels and that these remained influential when the children were 10 and 12 years of age, having already been exposed to a large number of other influential agents besides the mother, such as various different teachers and peer groups.

Consistently, when contrasted with expressed emotion literature, which also uses maternal descriptions of their children, this study's findings seemed to be in agreement with previous research, indicating that increased parental responsiveness and EE warmth were related to children's increased intellectual ability, literacy performance and academic achievement (Bornstein & Tamis-LeMonda, 1989; Estrada et al., 1987; Landry et al., 2001; Morrison & Cooney, 2002). As the maternal scales were previously shown to be related to EE warmth, it is likely that this relationship could account for some of the association between the maternal scales and children's intellectual ability. However, when this hypothesis was tested, Descriptive Reasoning remained significantly associated with children's IQ at age 12 over and beyond EE warmth and negativity. These findings suggest that the covariance between the maternal scale and the EE measures did not account for the association found between Descriptive Reasoning and children's IQ. These suggest that the maternal scales are capturing distinct structural features of maternal narratives uniquely associated to children's cognitive development. The maternal scales are thus making an original and useful contribution to extend the scope of narrative research.

Results also indicated that the associations found between Descriptive Reasoning and children's intellectual ability varied according to the children's gender. Boys' reading ability seemed to be particularly associated with maternal narratives with poorer narrative construction, characterized

by lower levels of coherence, reflectiveness and openness, than the girls. These findings are consistent with existing literature describing gender differences in relation to children's reading ability, in which boys were found to experience more difficulties (Rutter et. al, 2004). Overall, the results presented in this chapter are consistent with previous literature, indicating that the way mothers' organized their narratives were related to their children's intellectual ability. Together, they demonstrate that the maternal scales were a valid measure for extracting structural features of maternal narratives related to children's intellectual ability over and above measures of EE.

I expected that the structural features of maternal narratives, as measured by the maternal scales, would also be related with children's social ability. This hypothesis was based on literature showing that mothers who remained coherent and reflective when describing their early attachment experiences were more likely to have children with higher social ability, even after taking into account parenting styles, children's verbal intelligence and infant–parent attachment patterns (Steele, et al., 2002). As anticipated, children whose maternal narratives were more coherent, reflective and open, but a little inconsistent, had higher social ability. Descriptive Reasoning was not only associated to children's social ability but it strengthened Relevance's contribution to children's levels of prosocial behaviour. However, the inverse relationship found between Relevance and children's social ability was not expected but this could be understood. This scale has been shown to capture structural features of maternal narratives which seemed related to high levels of maternal anxiety, over preoccupation and controlling behaviour, all of which have been associated with higher rates of internalizing (Bosquet & Egeland, 2006; McCarty et al., 2005) and antisocial behaviour (Rubin et al, 1998). Thus, it is likely that mothers whose narratives focused solely on the task of describing the child for over 5 minutes - without interruptions or distractions - were more likely to have a more anxious, preoccupied or controlling attitude towards their children's behaviour. These maternal attributes could indirectly explain the unexpected relationship between Relevance and children's social ability. Additionally, it is likely that when these more anxious, preoccupied and controlling mothers had narratives also marked

by poor coherence, reflectiveness and openness, this combination could have had a bigger detrimental effect in the children, leading to even lower levels of prosocial behaviour.

Furthermore, this study's findings indicated that children's earlier ratings of social problems seemed to affect the maternal scales, which, in turn, seemed to influence children's social problems later in life. Therefore, children's social problems seemed to be a product of dynamic interactions between the children and their environment, as earlier measures of children's social problems affect the maternal scales, just as these scales influence later measures of children's social problems. Thus, the structural features of maternal scales seemed to capture maternal attributes related to risk factors that contribute to and shape children's social behaviour and which, in turn, seemed to be influenced by the children's social behaviour. These findings are consistent with earlier literature suggesting that the development of serious social problems were best understood as a dynamic interaction between the children and the environment, which may continually change over critical periods of the children's development (Prior & Paris, 2005; Damon & Lerner, 2006). This dynamic interaction between genetic and environmental factors influencing children's social behaviours over the course of development is particularly complex and difficult to analyze (Tarter et al. 1999). This is mostly because certain factors, such as parental attitudes, shape children's social behaviour and cognitive development via genetic, but also strong environmental rearing effects (Jaffee et al., 2004; Plomin et al., 2002). Consequently, one implication of these findings for clinical and research programs is that the existing links between the structural features of maternal narratives and children's social ability may be more appropriately understood in the context of complex and dynamic interactions which seemed to be specific to each developmental stage. Thus, understanding the way parents and children dynamically adapt and adjust to a changing child or parent, changes in themselves and changing life situations needs to be considered to formulate effective intervention programmes and design informative research methods. A second implication is that the maternal scales could be a useful tool in the clinical context when compared with other existing measures, such as the AAI and the EE. The AAI, although it captures structural features of maternal narratives, it does

not focus on descriptions of the children and is both time consuming and costly, whilst the EE is relatively a quick and simple measure for parents' descriptions of their children, but it does not extract structural features from their narratives. Therefore, the use of the maternal scales in both clinical and research settings could represent a significant saving in time and resources when trying to extract the structural features of maternal narratives proven to be related to children's externalising and internalising behaviour problems, intellectual and social ability. These new scales could be used in clinical and research settings to facilitate, for example, the detection of children that may be at greater risk for having lower intellectual and social ability, or to deepen our understanding on whether clinical interventions, such as adult or child psychotherapy, could alter the dynamic interaction found between the maternal scales and children's social ability. Yet gaps remain in our understanding of how children, family, school/community and peer factors interact to influence the structural features of maternal narratives and identifying these could help us determine the most appropriate targets for prevention and early intervention in different settings. Additionally, these could also identify specific intervention techniques which could change these structural features of maternal narrative and then prevent the identified associated problems in their children. Thus, continued research is needed to determine the most appropriate targets for prevention and early intervention that will produce lasting change in both mothers and children alike.

Overall, the present study suggests that the maternal scales are a valid and useful tool to explore the association between the structural features of the maternal narratives and children's intellectual and social ability. These results were, however, limited by four methodological features. First, we used narratives from mothers of twins across the UK to extract the maternal scales. Therefore, it is likely that potential specificities related to mothering twins might have influenced our ratings and, for this reason, caution is needed when generalising our findings to singletons. However, the associations found between the maternal narratives and children's cognitive development using twin data were aligned with previous studies of singletons (Crandell & Hobson, 1999; Estrada et al.,1987; Steele et al., 2002), indicating that it is likely that this

study's findings could also apply to singletons. Second, because this sample consisted of narratives extracted from biological mothers, one cannot be certain as to whether these results would apply equally to all primary caregivers and/or fathers. There is a possibility that unstudied peculiarities and specificities related, for example, to being a father, an adoptive parent or a grandparent could influence structural aspects of their descriptions which could, in turn, skew the ratings for the maternal scales. Third, the present investigation was limited to the associations between the maternal scales and children's intellectual and social ability. Thus, there were still many other aspects of children's development that have not been examined in relation to the maternal scales, including conduct problems, intellectual disability, language attainment, quality of peer relationships and attention deficit disorders. Based on previous research suggesting that disorganized maternal narratives, as measured by the AAI, predicts attention problems in the preschool years, particularly in the context of high environmental stress (Fearon & Belsky, 2004), it is likely that the maternal scales would be associated to children's attention deficits disorders, for example. Therefore, identifying individual differences in maternal narratives and establishing how these relate to children's cognitive abilities, particularly, in a high-risk context could help direct clinical interventions to increase children's chances to attain a normal intellectual and social development. These could represent interesting possibilities for future research, which could help to substantiate the construct validity of the newly developed maternal scales even further.

Overall, our results support the validity and usefulness of the new maternal scales in extracting the structural aspects of the maternal narratives associated with children's intellectual and social ability, as mothers whose narratives were coherent, reflexive and open tended to have children with higher intellectual and social ability. These analyses have indicated that the structural features, summarized by the maternal scales, were helpful when trying to predict children's development, after taking into consideration their levels of SES deprivation and previous intellectual ability. Thus, the maternal scales seem to be making a valid and unique contribution to narrative research.

Chapter 7: Discussion

The findings of this thesis have been discussed in detail in each of the four empirical chapters. The objective of this final chapter is to provide a general discussion of the underlying themes presented in this thesis. More specifically, it will focus on the contribution of this piece of research in providing a deeper understanding of the role of maternal narratives' structural features in supporting children's behavioural, intellectual and social development. It will also address the wider implications for future research and for professionals dedicated to promoting children's wellbeing.

7.1 Summary

Using prospective data from a large sample of twins born in England and Wales in the mid 1990s, the aim of the present research was to develop and test a new method to extract information from maternal narratives using the formulation and structure of their descriptions of their children. The new maternal scales aimed to derive a more complex and nuanced set of data than existing coding procedures, whilst being easy and quick to code. The thesis had four goals which were to: 1) develop and validate the new coding scheme for assessing structural features of maternal narratives; 2) examine the associations between these maternal scales and the mothers' personality, mental health history, experiences of victimisation and parenting; 3) investigate how these maternal scales relate to children's behavioural and emotional problems; and 4) test the associations between the new scales and children's cognitive development.

7.2 Main findings

7.2.1 Validity of the new maternal scales

The investigation of the construct validity of the maternal scales suggests that Descriptive Reasoning and Relevance adequately capture structural features of the mothers' short descriptions of their children derived from the Five Minute Speech Sample method (FMSS: Magaña, et al., 1986). The Descriptive Reasoning scale measures how narratives are constructed, how detailed and realistic these descriptions are and whether there is evidence of mothers' reflective ability. The Relevance scale examines how consistent and pertinent mothers' narratives are. Ratings are consistent across independent raters and stable over a period of five years. These results extend previous findings reporting stability of maternal narratives' ratings across two years for the EE and AAI (Crowell et al., 1996; Hesse, 1999; McGuire & Earls, 1994; Peris & Baker, 2000; Treboux & Waters, 2002; Vostanis & Nicholls, 1995). In relation to the convergent and discriminant validity of the maternal scales, results indicate that mothers' educational level and reading ability together with families' socio-economic disadvantage were associated with the new ratings, whilst the widely used EE codes (i.e. maternal warmth and negativity) only partially covered the constructs captured by the maternal scales. This is consistent with studies exploring the structural features of mothers' descriptions of their early attachment experiences using the AAI measure, which showed that narrative ratings are not entirely explained by mother's educational level or intellectual ability (Bakermans-Kranenburg & van IJzendoom, 1993; Crowell et al., 1996). The maternal scales are thus a valid measure of structural features of mothers' short descriptions of their children, as their new structural ratings were reliable and stable. Furthermore, the new scales extracted an original set of data associated with related measures, which could only be partially explained by other established narrative factors.

7.2.2 Maternal scales and mothers' characteristics

The maternal scales' ratings were associated with mothers' personality features, substance abuse and parenting behaviour. Mothers who are conscientious and focused, with few signs of

neuroticism, had higher scores in Descriptive Reasoning, as they tended to construct coherent, reflective and informative narratives. Mothers who were creative, aware of their feelings and helpful scored high in Relevance; tending to formulate pertinent and consistent descriptions of their children. These results are consistent with previous studies linking high neuroticism with reduced cognitive ability in verbal exercises (Baddeley, 1990, Eysenck, 1992a; 1992b; Hadwin et al., 1997), and high conscientiousness with increased attention and behavioural control (Derryberry & Reed, 2002; Higgins, et al., 2007; Lonigan, et al., 2004; Muris et al., 2007). Substance abuse was associated with increased levels of contradictions and incoherence in mothers' narratives and, consequently, low scores in Descriptive Reasoning. Mothers with higher experience of substance abuse appear to have more difficulty formulating coherent, reflective and informative descriptions of their children. These results are consistent with previous findings indicating that long-term drug abuse is related to cognitive distortions, including poor memory, planning and decision-making (Bechara et al., 2001; Grant et al., 2000). The new scales are thus extracting maternal factors associated with their ability to recall, formulate and relay information about their children related to their history of substance abuse. This finding contributes to further substantiate the validity and utility of the new scales. Parenting behaviour was also associated with mothers' narrative construction, as those with affectionate and supportive parenting styles formulated coherent, reflective and informative narratives. These results are in line with earlier studies in which less loving and more controlling mothers constructed more impoverished and idealised narratives, as measured by the AAI (Adam et al., 2004; Bosquet & Egeland, 2001; Crowell & Feldman, 1988). These indicate that structural features of mothers' descriptions of their children and their early attachment experiences, as measured by the new scales and AAI respectively, are both associated with their parenting behaviour. Therefore it is possible that the way mothers process, interpret and respond to their children's cues is influenced by their ability to organise and reflect on both their own experiences of being parented as well as their children's actual behaviour. This could therefore suggest that the constructs measured by the AAI may be

related to those captured by the maternal scales, further supporting the validity and usefulness of the new scales.

7.2.3 Maternal scales and children's behaviour problems

This thesis also shows that the maternal narratives' structural features, as summarised by Descriptive Reasoning and Relevance scales, are helpful when predicting children's externalising and internalising behaviour. Mothers whose narratives are coherent, reflective and open have children with fewer externalising behaviour problems, after accounting for socio-demographic factors, parenting measures and children's early histories of behavioural problems. Mothers with relevant, but unstructured, narratives had children with high levels of anxiety, withdrawn or depressive behaviours, after controlling for their previous accounts of internalising problems. Relevance's positive association with children's internalising behaviour was an unexpected finding. Further analyses, contrasting mothers' and teachers' independent reports of children's behaviour, according to the four different Relevance ratings (0 - distorted, narcissistic or preoccupied discourses; 1 - evasive and dismissive discourses; 2 - pertinent discourses with minor inconsistencies and 3 - consistent and pertinent descriptions), showed that mothers with high scores on the Relevance scale had children with the highest rates for internalizing behaviour, as rated by the teachers. Children whose mothers' narratives were consistent and pertinent were more anxious, depressed or withdrawn at school than children of mothers with low ratings. Studies have consistently demonstrated associations between maternal anxiety and over-preoccupation with children's internalising behaviour (Bayer et al., 2006; Bosquet & Egeland, 2006; McCarty et al., 2005). Thus it is likely that the Relevance scale captures structural features associated with mothers' levels of anxiety and over-preoccupation, which could potentially explain this scale's positive association with children's internalising behaviour. Furthermore, mothers with relevant narratives reported more than twice the number of children's externalizing behaviour informed by the children's teachers, whilst those with evasive and/or

preoccupied narratives received the highest scores for externalizing behaviour, by mothers and teachers independently. The evasive/preoccupied mothers' quality of reporting on children's behaviour problems therefore seems to be reliable, as it approached their children's teachers' scores. Overall, these results make an original contribution to research methods by offering further support towards the validity and usefulness of the new scales in extracting structural features related to children's behaviour problems.

7.2.4 Maternal scales and children's cognitive development

Findings indicate that mothers whose narratives were coherent, reflective and open had children with higher IQ scores, and greater reading ability and academic performance in both English and Mathematics. Mothers' scores on the Descriptive Reasoning scale predicted children's intellectual development over and above their initial intellectual ability levels. This result is in line with previous studies indicating that mothers who describe their early attachment experiences coherently tend to have young children with higher IQ, after accounting for children's earlier IQ and family socio-economic status (Crandell & Hobson, 1999). This doctoral thesis extends earlier findings in two ways. First, it shows that mothers' coherence levels derived from short descriptions of their children can also be used to predict children's intellectual development over and above measures of EE. Second, it examines older children to demonstrate that maternal narratives remain decisive in later childhood, after the children have been exposed to many other powerful influences apart from their mother, including several teachers and social groups. Nonetheless, this association seems to differ according to the children's gender: compared to girls, boys' reading ability was more negatively affected by maternal narratives marked by lower levels of coherence, reflectiveness and openness. This thesis therefore contributes to expand current knowledge on reading difficulties by identifying that the way mothers structure their short descriptions, as measured by the new ratings, are associated with their children's intellectual development. These findings demonstrate further the validity and utility of the new scales.

Results also show complex and dynamic interactions between children's social problems and the maternal scales' ratings. In particular, children's earlier measures of social problems were related to maternal scales' ratings, which, in turn, were associated with children's later levels of social problems even after controlling for maternal warmth and negativity. This suggests that the structural features, as assessed by the new scales, capture maternal attributes that contribute to shape, whilst also being influenced by, children's antisocial and delinquent behaviour. This is consistent with previous research showing that children's social behaviour is shaped by interactions with their mothers, as they dynamically adjust to each other (Damon & Lerner, 2006; Prior & Paris, 2005).Thus, in order to formulate effective intervention programmes and design informative research methods, there should be a consideration of the continuous adaption between mother and child, as well as the changing life situations in each specific developmental stage. Additionally, the inverse association found between Relevance and children's social ability seems consistent with earlier findings (i.e. Relevance's positive association with children's internalising problems). This further suggests that the Relevance scale captures maternal factors related to high levels of maternal anxiety, over-preoccupation and controlling behaviour; all of which have previously been associated with higher rates of antisocial behaviour (Rubin et al., 1998). Furthermore, this thesis indicates that older children are still responsive to changes in maternal narratives' structural features, just as their mothers' descriptions continue to be influenced by differences in their children's social behaviour. An effective parenting programme aiming to reduce children's antisocial and delinquent behaviour may therefore benefit from not only addressing mothers' parenting behaviour directly, but also from targeting mothers' structural features. Results therefore suggest that a new method which combines these two strategies may improve the effectiveness and success rates of such parenting programs.

7.2.5 Commonality and specificity of findings for Descriptive Reasoning and Relevance scales

Specific patterns of associations were found between Descriptive Reasoning and Relevance, as highlighted in three main findings. Descriptive Reasoning was associated with all five scales for mothers' personality features, whilst Relevance was related to two: conscientiousness and openness. Importantly, Descriptive Reasoning's association with mothers' conscientiousness, openness, extroversion and agreeableness remained significant once the potentially confounding influence of SES disadvantage and several different parenting measures were controlled for. Only conscientiousness remained associated with Relevance after taking into consideration mothers' experience of SES. These findings suggest that deficits in mothers' levels of organization, creativity and sociability continue to have a strong negative impact on their ability to structure their narratives, as measured by Descriptive Reasoning, after accounting for their experiences of socio-economic hardship and their parenting behaviour. One implication of this finding for research and clinical practice is that teaching mothers new parenting skills alone may not suffice to change the way they perceive, interpret and organize information about their children. As such, this might lead to inconsistencies in parenting which could potentially weaken the efficiency of such parenting programmes. Thus it is likely that parenting programs may be more useful if they also consider differences in mothers' personalities, since these seem to underlie their way of retrieving, processing and structuring information about their children, as measured by the new scales. If, during these programs, mothers' newly acquired parenting skills are aligned with, and supported by, positive changes in their personalities, their interactions with their children are more likely to be consistent, calm and firm, reducing the incidence of children's behavioural, emotional and social problems and increasing success rates of intervention.

The Descriptive Reasoning and Relevance scales capture distinct maternal features linked with children's behaviour disorders, which cannot be fully explained by their children's history of behaviour problems, experiences of socio-economic deprivation and parenting styles. Descriptive Reasoning was associated with children's rates of externalising behaviour at ages 10 and 12 after accounting for the potential influence of SES disadvantage, children's previous histories of externalising behaviour and parenting measures. Relevance, however, was associated with

children's rates of internalising behaviour at age 10 and this remained after controlling for SES disadvantage, EE measures (i.e. maternal warmth and negativity) and several parenting measures. The inverse relationship between Relevance and children's social ability consistently indicates that this scale may capture structural features associated with mothers' anxiety, over-preoccupation and controlling behaviour known to be linked with increased levels of internalising and antisocial behaviour (Bayer et al., 2006; Bosquet & Egeland, 2006; McCarty et al., 2005; Rubin et al., 1998). These new scales may therefore capture distinct but complementary aspects of maternal narratives' structural features related to different types of children's behaviour problems. More specifically, mothers whose narratives were coherent, reflective and informative had children with lower rates of externalising behaviour, whilst those who focused more easily on describing their children had more anxious, withdrawn or depressed children.

Maternal Descriptive Reasoning predicted children's intellectual abilities over and above their earlier intellectual ability levels. In relation to children's social cognition, this scale was related to their prosocial behaviour at ages 10 and 12 and social problems at age 12, whilst Relevance was not associated on its own to any measures of children's cognitive ability. Descriptive Reasoning therefore seems to effectively extract maternal narratives' structural features related to children's cognitive development. These findings are consistent with this thesis' previous results, as they demonstrate once again that the new scales are measuring distinct attributes of mothers' short descriptions of their children.

However, there are commonalities between the two scales, as Descriptive Reasoning and Relevance strengthen each other's association with children's behaviour problems and social cognition. For example, Relevance's association with children's prosocial behaviour at age 12 and social problems at ages 10 and 12 was enhanced when Descriptive Reasoning was included in the same regression model. These commonalities indicate that mothers who are more relevant (and potentially more preoccupied, controlling and anxious about their children's behaviour), could also have narratives marked by poor coherence, reflectiveness and openness. This

unhelpful combination might have a stronger association with children's negative development, leading to lower levels of prosocial behaviour. The new scales thus assess separate maternal narratives' structural features which, when combined, have a markedly negative association with children's antisocial and delinquent behaviour. This doctoral thesis therefore offers preliminary evidence to suggest that the new maternal scales are an easy and rapid method for coding and extracting narratives' structural features derived from mothers' short descriptions of their children associated with children's behavioural, emotional and cognitive development. The newly developed scales add further depth to the collection and analysis of maternal narratives, representing an original and useful contribution to research methods and clinical practice.

7.3 Originality of the research

This thesis is the first to explore a new set of scales designed to extract maternal narratives' structural features from short descriptions of their children. A validated new instrument that is quick and easy to use, and that may well be applied to existing narratives, represents an original and relevant contribution. This is particularly true as existing measures for analysing maternal narratives' structural features are expensive and time consuming.

This doctoral thesis makes another original contribution to current research by showing that the maternal scales, unlike other pre-existing narrative measures (i.e. EE and AAI), extract information that goes beyond parenting. More specifically, the new scales capture structural features, which are more closely related to the mothers' own personality characteristics than to their parenting behaviour, as their associations with mothers' personality features remained after controlling for several different parenting measures. Results show that the new scales assess maternal features related to the mothers' ability to think about, organize and relay information about their children, which exceeds their way of relating to them and also goes beyond differences in their twins' behaviour. These findings set the maternal scales apart from other pre-

existing narrative measures, demonstrating that the new scales' ratings provide additional information to that captured by the preceding narrative measures.

This thesis also contributes to expand current literature by exploring the associations between the newly designed maternal scales and children's behaviour problems. Structural distortions, as captured by the Descriptive Reasoning and Relevance scales, are useful to predict children's externalising and internalising behaviour, after accounting for their initial levels of behaviour problems. Descriptive Reasoning's association with externalising behaviour, however, was weakened by maternal warmth, whilst its relationship with internalising behaviour was partially explained by child neglect. These represent an important limitation to this study, as they confine the uniqueness of the contribution made by Descriptive Reasoning in relation to children's behaviour problems. Nevertheless, these parenting measures did not have an effect on Relevance's association with children's internalising behaviour, which contributed to further ascertain the validity and utility of this scale. Despite these dampening effects observed, this doctoral thesis uniquely contributes to expand current knowledge, as it is the first to indicate that maternal narratives' structural features, derived from mothers' short descriptions of their children, can predict the development of children's behaviour problems.

Moreover, mothers' scores on the Descriptive Reasoning scale were shown to have an impact on children's later intellectual ability over and above their initial ability levels. These results contribute to extend previous attachment research, by suggesting that structural features of mothers' short descriptions of their children may predict their intellectual development. These original results suggest that mothers continue to play a crucial role in their children's cognitive development, even after their children have been exposed to many other significant people and different learning environments, including several social groups and teachers. Intervention and research programs therefore could benefit from concentrating on engaging mothers' participation to increase their success rates, reduce older children's behaviour problems and develop new ways of promoting their physical and mental health.

A final original contribution made by this thesis is that the new scales' ratings measure maternal attributes that dynamically interact with children's social behaviour. Results show that the maternal scales capture mothers' qualities which are influenced by earlier measures of children's social behaviour and that contributes to shape their children's later social development. The new scales thus reliably assess maternal narratives' structural features associated with children's intellectual and social development and this represents an original contribution to narrative research and clinical practice.

7.4 Evaluation of study methods and approaches

The results presented provide evidence in support of the psychometric properties of this new set of scales, including their reliability, stability and validity. It is important to conduct a detailed assessment of the methodology used, including its strengths and limitations, and this will be considered in the next section.

7.4.1 Strengths and limitations of the present study

A major methodological strength is that data used in this doctoral thesis derived from a large subsample of families participating in the E-Risk study, which investigates a population sample of 2,232 children and their families. The E-Risk study retained 96% of the original cohort. These high response rates minimise the likelihood that attrition introduced biases in the findings as a result of an over- or under-representation of a specific demographic group. For example, high risk families may be less likely to participate due to hectic and disorganised lives, resulting in the study cohort no longer being nationally representative and having an inflated number of low risk families. This thesis' findings therefore have not been negatively influenced by a considerable loss of participants, or of groups of participants, which is often a difficulty for longitudinal studies.

A second methodological strength is that it uses a prospective longitudinal design. This research design follows the individuals through time, collecting data at regular intervals. The advantage of this approach is that it allows researchers to track down events as and when they occur, reducing measurement error due to poor recall of past exposures. The prospective longitudinal design thus allows a more accurate study of developmental trends and temporal sequence between maternal narratives and children's outcomes, as it can offer a clearer support for the directionality of the associations between variables, whilst controlling for initial rates of children's behaviour problems and cognitive characteristics.

A third strength of this research is that follow-up visits were carried out at key stages of children's development (i.e. when the twins were aged 5, 7, 10 and 12 years). This enabled factors of interest to be examined for stability and change over time. By using repeated measures, it was also possible to detect change in children and their environments from one age to the next. The follow-up visits assessed important milestones in children's cognitive, emotional and social development. For example, children's growing independence at school entry at age 5, acquiring basic literacy at age 7, developing their self-awareness and inner control at age 10, and attaining increased concentration by the time of transition to secondary school at age 12. Furthermore, during these years, children are gradually exposed to many new environments, as their world grows outward from the family, and relationships are formed with new friends, teachers, coaches and others. As children's experiences expand, more factors can potentially alter their development. Thus, a major advantage of this research design is that it allows researchers to investigate factors that may hinder children's development, providing data to test hypotheses about the effects of a wide range of variables on the children, as they grow.

A fourth methodological strength is that the present study uses independent measurements of twins' behaviour problems and cognitive development. Data on children's behaviour were derived from teachers' and mothers' reports; whilst information on children's cognitive development was obtained directly by examining the children themselves and indirectly via teachers'

questionnaires. Teachers' independent reports of children's behaviour problems and academic performance were used based on the assumption that they are unlikely to be contaminated by the maternal narratives' structural features, providing a stronger test of the association between the maternal scales' and children's behaviour problems and cognitive development. This multiple informant (i.e. mothers, teachers and interviewers) and multiple method approach (i.e. speech coding, interviews, postal questionnaires and observations) strengthen the present findings by supporting the validity and reliability of the data. Furthermore, the extensive measures of development and environmental risk from multiple informants allowed analyses to account for a number of confounders, including child specific and family-wide factors.

A fifth methodological strength is that this doctoral research conducted a thorough test of validity of the new maternal scales, including five different steps: inter-rater reliability, temporal stability, construct validity, analysis of potential biases and analysis of the internal structure. Results consistently showed that the Descriptive Reasoning and Relevance scales measured maternal narratives' structural features present in short speech samples. Additionally, they demonstrated that the new scales' ratings are meaningful and useful, as they are associated with mothers' individual characteristics and children's development beyond established measures of parenting and socio-demographic confounders.

Despite the strengths of this doctoral research, there are some limitations which must be acknowledged. Firstly, the studied narratives derived exclusively from a sample of mothers of twins. This idiosyncrasy could limit the generalisation of these findings to mothers of twins solely, because the added burden of having two babies simultaneously may have skewed the base rates of some measures, including the maternal scales' ratings and parenting behaviour. More specifically, the added emotional strain of giving birth to and parenting twins may disrupt a mother's ability to think about these two children separately which could, in turn, negatively affect her ratings on the Relevance scale. It is therefore possible that potential specificities related to the strain of mothering twins may have influenced the reported findings. Caution is therefore

needed before generalising these results to non-twin families. However, previous studies of the associations between maternal narratives and children's behavioural outcomes and cognitive development have indicated little difference in findings when comparing twin data with earlier studies of singletons (Caspi et al., 2004; Crandell & Hobson, 1999; Estrada, Arsenio, Hess, & Holloway, 1987; McCarty et al., 2004; Steele et al., 2002).

Additionally, caution is required before generalising the findings to all caregivers, as unstudied specificities related to being a mother, a father, an adoptive parent and/or a grandparent could have an impact on their narratives' structural ratings. Studies exploring differences in the content of mothers' and fathers' speech suggest that mothers' descriptions tend to be more sensitive to the child's abilities (Chanu & Marcos, 1994). These findings suggest that there could be structural differences between mothers' and fathers' speech and that, in turn, children may communicate differently with mothers and fathers, reinforcing distinctions in their parental roles. However, because all the mothers included in this investigation had twins, this factor was held constant across families and therefore it did not invalidate our comparison between maternal scales' ratings. Care is thus needed before generalising these results to all caregivers, since one cannot assume that they could be equally applied to everyone.

A second limitation is that shared informant and method variance could have inflated this thesis' findings. This is because mothers reported the speech samples plus several outcome measures (i.e. mothers' personality, psychopathology, experiences of victimisation and children's emotional and behavioural problems). Many attempts were made to minimise this possibility by using different informants and multiple measurement modalities, including teachers' questionnaires and home visitors' ratings. Additionally, the associations between children's behaviour problems were examined, comparing mothers' and teachers' evaluations separately. Furthermore, potential differences in the mean levels of children's behaviour problems reported by mothers and teachers could potentially be mirroring genuine differences in their behaviour at home and at school, rather than resulting solely from reporting bias. This is because the correlational

estimates of cross-informant agreement are known to fluctuate from low (around 0.13) when parents and teachers report on internalizing symptoms to moderate (around 0.32) when they report on externalizing behaviour problems (De Los Reyes & Kazdin, 2004; Hinshaw, Han, Erhardt & Huber, 1992; Kazdin, 1994; Kraemer et al., 2003).

A third consideration relates to the exclusive use of the mothers' descriptions of their children as maternal narratives and the absence of other types of narratives, such as the AAI, descriptions of mothers' mental health history or earlier experiences of victimisation. Due to this methodological limitation, analyses could not be extended to examine any other specific association between the maternal scales' ratings and different areas of mothers' functioning. Theory suggests that mothers could potentially compartmentalise part of their functioning to protect their reflective ability (i.e. their capacity to think about one's own and others' behaviour and emotions in terms of mental states) from more general cognitive distortions to partially preserve specific (i.e. mother and child) relationships (Fonagy & Target, 2005). This defensive split (i.e. compartmentalization and segregation of certain overwhelming and painful mental states accompanying traumatic experiences) may safeguard mothers' reflective ability aimed at specific relationships from the negative impact stressful experiences may have on their more general functioning. The most commonly used defensive mechanisms to minimise the negative influence of painful memories on one's overall functioning include denial, minimisation, rationalisation, self-blame and memory biases (Coker et al. 2002; Heise & Garcia-Moreno 2002). This defensive split may partly explain why mothers' experiences of victimisation, for example, did not have an effect on the structural features of their descriptions of their children. Future research could further explore these issues by investigating the protective impact that mothers' defensive strategies may have on their narratives' structural features when describing their children and their experiences of victimisation.

A fourth limitation is that, even though the psychometric properties of the new scales have been explored at length, further research is still needed to determine the specific maternal attributes

behind the structural features measured by the Descriptive Reasoning and Relevance scales. The new scales seem to tap into underling maternal characteristics, including personality and overall cognitive functioning, both of which may influence the way mothers interpret and organize information about their children and their way of formulating and constructing their narratives. It is possible that the new scales, like other measures of maternal narratives' structural features, are measuring mothers' attachment strategies. Since the E-Risk study does not utilise any measure of attachment, it was not possible to test whether the new maternal scales are capturing mothers' attachment styles. Based on this thesis' findings, it is difficult to determine the extent to which these (or other maternal features) are influencing mothers' narrative construction, determining their coherence, relevance, reflection and consistency levels.

Fifth, the specific cultural context of this study, which was conducted mostly in the UK, means that only tentative conclusions about the psychometric properties of the maternal scales in general can be derived. It is possible that different cultural values could impact on mothers' narrative construction. For example, mothers in Japan tend to spend most of their time with their infants, sleeping in the same room and rarely leaving them with other carers or babysitters (Miyake, Chen, & Campos, 1985). Conversely, those in Brazil living in areas of chronic poverty and high infant mortality are emotionally disconnected from their infants at first, as bonding is delayed until after the first year of life (Scheper-Hughes, 1992). It is therefore likely that variations in cultural experiences may differentially affect mothers' abilities to formulate and structure their descriptions of their children when compared to typical British families. These limitations present interesting possibilities for future research, which could further substantiate the construct validity of the newly developed maternal scales. Future replication studies investigating short speech samples from mothers and fathers of singletons**,** clinical groups and across different cultures could help determine how far this thesis' results can be generalised outside of its particular sample. Despite these shortcomings, this study's results, using data from multiple informants with analysis controlled for socio-demographic confounders and parenting measures, suggest the

validity and utility of the new maternal scales in broadening the ambit of maternal narrative research.

7.4.2. Integrating findings across different lines of research

Findings derived from different lines of research consistently indicate that mothers' personality features are associated with their ability to think about, process information about, and establish more positive relationships with, their children. Recent studies investigating the association between mothers' personality and their knowledge, perceptions and practices of parenting suggest that those who score high in openness to experience, extraversion and conscientiousness, and score low in neuroticism, demonstrate positive parenting attitudes and beliefs (Bornstein, Hahn & Haynes, 2011; Prinzie, Stams, Dekovic, Reijntjes & Belsky, 2009). Openness to experience is associated with mothers' awareness, competence and investment in parenting as well as observations of mothers' symbolic play with their children. Conversely, neuroticism is shown to amplify the stresses of life circumstances and undermine parenting behaviour (Bornstein et al., 2011). These results align with findings from this thesis that mothers' personality features (i.e. high conscientiousness, openness to experience, extraversion and agreeableness, and low neuroticism) are positively associated with mothers' narrative construction. In particular, this is apparent for those who do not experience socio-economic deprivation. Mothers' personality features therefore seem to affect not just their parenting behaviour and their ability to positively process information about their relationship with their children, but also their ability to structure their descriptions of their children, even after taking into account their concurrent parenting behaviour and their social and economic status.

In relation to substance abuse, studies using different lines of research established links between repeated substance abuse and reduced cognitive abilities, even in the absence of drugs (Bechara et al., 2001; Grant et al., 2000). More specifically, results suggest that more evasive and inconsistent narratives, as measured by the AAI, are associated with higher likelihood of

substance abuse and lower rates of participation in rehabilitation programs (Caspers, Yucuis, Troutman & Spinks, 2006). Substance abuse thus influences mothers' overall reasoning ability, making them less able to judge, plan effectively and participate in rehabilitation programs. Consistent with previous research, findings reported in this thesis suggest that mothers' history of substance abuse negatively influence their narrative construction, leading to lower levels of coherence and consistency, as measured by Descriptive Reasoning and Relevance scales. The inverse direction, however, is also a possibility, as mothers with cognitive difficulties may be more likely to have a history of substance abuse. The concurrent nature of these maternal measures prevents us from drawing any conclusions about the direction of this association. Future research might be able to clarify this, by employing a longitudinal design.

Studies suggest that structural features of adults' descriptions of their attachment experiences, as measured by the AAI, reflect important differences in the organisation of parents' expectations and perceptions of their children, which influence their parenting and children's behaviour (Bakermans-Kranenburg & Van IJzendoorn, 2006; Grossmann et al., 2008; Main et al., 1985; Steele et al., 2002). Longitudinal research has demonstrated reciprocal relations between mothers' reports of physical discipline, and teacher- and self- ratings of children's externalising behaviour: high levels of physical discipline and externalising behaviour in a given year predict higher levels of physical discipline and externalising behaviour in the following year (Lansford et al., 2011). When focussing on a high-risk sample of older boys aged 10 to 15, mother-reported physical discipline in a given year predicts children's ratings of antisocial behaviour in the next year, but antisocial behaviour does not predict parents' use of physical discipline in the following year. These findings are not moderated by gender, race, socio-economic status, or the severity of the physical discipline. This thesis' results are aligned with these findings by showing that maternal narratives' structural features of short descriptions of their children are associated with older children's rates of externalising and internalising behaviour, after taking into account socio-demographic factors, parenting measures and children's early histories of behavioural problems. Furthermore, the link between maternal narratives' structural features, children's behaviour

problems and parenting styles identified by different lines of research could probably account for the dampening effect of maternal warmth and child neglect on the maternal scales' association with children's behaviour problems.

In relation to children's cognitive development, attachment research suggests that children of mothers whose descriptions of their early parent-child relationships are coherent and reflective have higher IQ, even after controlling for their previous IQ and family socio-economic status (Crandell & Hobson, 1999; Crowell and Feldman 1988). Findings from this thesis consistently indicate that children of mothers whose narratives are coherent, reflexive and open have higher intellectual and social ability. This is shown by the relationship between maternal scales' ratings and both children's intellectual ability and prosocial behaviour at 10 and 12 years of age. This occurred over and above their initial ability levels at age 5. These results emphasize the importance of familial experience as an influence on children's later cognitive and social development. The specific mechanisms by which mothers' structural features may affect children's cognitive development are still unknown. Nevertheless, these associations may be somewhat explained by differences in mothers' attachment styles, level of stimulation and even plasticity of children's brains, particularly, in the structures specialised in verbal processing. Future research could further investigate this issue, by exploring these possibilities and other potential mechanisms. Early life and familial experiences thus continue to shape older children's cognitive and social development, despite the substantial changes during puberty that affect many aspects of their lives, including physical and cognitive transformations (Kuhn, 2009; Susman & Dorn, 2009), changes in parent-child and peer relationships (Collins & Steinberg, 2006), and schooling (Eccles & Roeser, 2009).

7.5 Implications for research and clinical practice

Research on risk and protective factors suggests that children's well-being and development are significantly associated with their familial environment. Warm and supportive relationships with

parents, combined with adequate parenting (such as providing consistent rules and clear structure) promote positive physical and mental health, social integration and school achievement (Coie, 1996; MacMillan et al., 1999; Patterson, DeGarmo, & Knutson, 2000; Rutter, 1996; Sanders & Dadds, 1993; Webster-Stratton, 1993). Studies have also consistently shown that psychological disorders tend to begin in childhood and often persist into adulthood (Aguilar, Sroufe, Egeland, & Carlson, 2000; Costello, Mustillo, Erkanli, Keeler, & Angold, 2006; Kim-Cohen et al., 2003). Therefore, research and clinical work could benefit from a new set of scales capable of extracting fresh data that goes beyond parenting, providing additional information to that captured by the pre-existing measures and extending our understanding of maternal narratives and their impact on children's development.

Clinicians and researchers involved in interviewing mothers could also gain from developing an improved understanding of the potential negative influence that mothers´ personality features could have on the structural features of their descriptions of their children. By taking this new information into consideration, researchers could be better prepared to converse with mothers and analyse any data derived from mothers' reports of their children, particularly among high-risk groups. Mental health professionals may also benefit from this deeper understanding of maternal narratives' structural features to gain additional information on mothers' characteristics and familial environment. This could be useful in their clinical work with families to reduce the prevalence of mental health problems in children and improve the success rates of interventions. Furthermore, studies like the present one could unlock the door to future research on related questions about the link between maternal narratives' structural features, personality, parenting and child development. Investigating these associations further could be useful to elucidate more precisely the processes by which mothers' characteristics play a role in their day-to-day decisions about childrearing and their children's social routines. This is also relevant to untangling the moderating role of personality traits on the efficacy of parenting practices and in the design of tailored and successful interventions. Additionally, this investigation could help to assess co-parenting in parents with similar and differing personality profiles. This is because the new scales

go beyond measures of parenting by offering original and specific information about parents' ways of thinking about their children, which are associated with their personality profiles and their children's development. These findings could, for example, be useful to investigate further the roles of negative personality characteristics in narrative construction, parenting strategies and children's development. This may represent an important development considering that approximately one in five children has a mental or behavioural disorder with disability (Carter, Wagmiller, Gray, McCarthy, Horwitz & Briggs-Gowan, 2010) and that children with mental or behaviour problems are more likely to experience poor peer relationships, low academic achievement, reduced self-esteem and a greater risk of substance abuse and delinquent behaviour (Loeber & Farrington, 2001; Oliver, Barker, Mandy, Skuse & Maughan, 2011). Yet gaps still remain in our understanding of how maternal narratives' structural features interact with children, family, school/community and peer factors. Identifying these connections is important as it could help us determine the most appropriate targets for prevention and early intervention in different settings.

The new maternal scales may be particularly useful in extracting structural features of narratives, which are associated with mothers' personality features and children's externalising and internalising behaviour problems, and their intellectual and social abilities. Applying these new scales in clinical and research settings could therefore facilitate the detection of children that may be at greater risk of behaviour problems, lower intellectual ability and social difficulties. Furthermore, the use of the maternal scales in both clinical and research settings could represent a significant saving in time and resources in comparison to existing narrative measures.

Another implication of this thesis' findings for clinical and research programs is that the existing links between maternal narratives' structural features and children's social ability may be better understood in the context of complex and dynamic interactions which seem to be specific to each developmental stage. Therefore, when designing effective parenting intervention programmes and informative research methods, it is important to retain an understanding of the way in which parents and children continuously adapt and adjust to a modifying child and/or parent and to

changes in their life circumstances. Widely available, easily accessible and empirically supported parenting interventions for young children could have an enormous public health impact. This is particularly relevant considering that approximately half of children with significant behaviour problems at school entry are expected to show more serious behavioural and academic difficulties throughout elementary school and into adolescence (Carter, et al., 2010). It is well-known that programs focussing on parenting in the family context, or on the training of social competence in the school context, can be extremely useful in the prevention of further behavioural problems, conduct and adjustment disorders, including depression and anxiety (Gillham et al., 2006; Reid, 1993; Reivich, 2010; Webster-Stratton, Reid, & Stoolmiller, 2008). This thesis' findings indicate that specifically integrating the information captured by the new scales could help to increase the effectiveness of such programs.

Finally, the maternal scales could be utilised as an assessment tool to identify families at increased risk. For example, the new scales may be used as part of a more detailed and comprehensive assessment to locate strengths and weaknesses of how mothers think about their children which could affect the quality of their relationship. These new data could help professionals locate negative maternal qualities (e.g. lack of coherence and reflectiveness) which could be associated with their children's developmental difficulties. The new scales could be a quick and easy alternative assessment measure to help professionals identify families in need of parenting programs and adult psychotherapy to strengthen mothers' positive attributes and curtail the harmful ones to promote children's wellbeing.

Findings reported in this thesis suggest that experiences of victimisation or depression do not influence mothers' ability to concentrate during an interview designed to formulate pertinent descriptions of their children. This is consistent with earlier findings that mothers may be able to compartmentalise parts of their functioning to protect a specific relationship (i.e. with their children) from the negative impact difficult experiences (e.g. mental health problems and experiences of childhood abuse) could have upon their more general cognitive ability. Therefore,

it is possible that mothers' reflective ability, specifically associated with their relationship with their children, may remain partly protected after being split off from their more impaired general functioning. This could have useful implications for clinicians when designing future interventions aimed at improving mentally ill and victimised mothers' psychosocial health, as they could potentially mobilise this better preserved part of mothers' functioning to help them engage further in therapeutic work.

In order to guide mental health professionals further in the future, it would be important to explore whether mothers' inabilities to formulate clear and consistent descriptions of their children (found to be associated with their personality features) could also influence their capacity to recognise and accept their children's disorders. If this is the case, it might limit their ability to support their children in overcoming these problems, impeding their involvement in their treatment.

7.6 Future directions

To further substantiate the validity and utility of the maternal scales, future replication studies could use short descriptions from mothers and fathers of singletons, clinical groups and across different cultures. These examinations could help determine how far this thesis' findings can be generalised outside of its particular sample.

Researchers could extend this line of investigation by exploring the directionality of the associations found between the maternal scales' ratings and mothers' characteristics, including personality features, substance abuse and parenting behaviour. Future studies could also explore other potential factors that may have a moderating effect on the investigated relationships. For example, the maternal scales were not associated with mothers' experiences of victimisation. Research has suggested that mothers may be able to protect their reflective ability in relation to a specific relationship (i.e. with their children) from the negative impact stressful experiences have upon their more general reflective ability (Fonagy & Target, 2006). It is therefore possible that the reduction in mothers' reflective ability and the increase in cognitive distortions (i.e. denial,

minimisation, rationalisation, self-blame and memory biases) usually associated with these distressing memories (Coker et al. 2002; Heise & Garcia-Moreno 2002) may not apply in the context of the mother–child relationship. Each of these defensive strategies could play an important role in explaining why mothers' experiences of victimisation were not associated with structural features of their descriptions of their children, making them prime candidates for further investigation. One possible way of exploring these issues further could be by contrasting different types of maternal narratives to examine whether these defensive strategies could have a protective impact on their narratives' structural features when describing specific relationships (i.e. mother and child).

There are still many other aspects of children's development that have not been examined in relation to the structural features, including conduct problems, intellectual disability, language attainment, quality of peer relationships and attention deficit disorders. Based on previous research suggesting that disorganised maternal narratives, as measured by the AAI, predict attention problems in the preschool years, particularly in the context of high environmental stress (Fearon & Belsky, 2004), it is likely that the Descriptive Reasoning and Relevance scales could be associated with children's attention deficit disorders. Therefore, identifying individual differences in maternal narratives and establishing how these relate to children's cognitive abilities, particularly in a high-risk context, could help direct clinical interventions to increase children's chances of optimising intellectual potential and social development. These could represent interesting possibilities for future research, which could further substantiate the construct validity and the utility of the newly developed maternal scales.

Furthermore, findings from this thesis also highlight that structural features of maternal narratives dynamically interact with children's behaviour problems, whilst also being associated with children's cognitive development. This may be an important factor for researchers to focus on when investigating ways through which maternal narratives may influence children's adjustment problems. By utilising longitudinal prospective data from large cohorts, researchers could

investigate whether children's cognitive skills (i.e. cognitive attributional styles and reflective ability) may mediate the relationship between exposure to mothers' poorer narrative construction (characterized by lower levels of coherence, reflectiveness and openness) and developing behavioural problems. By also incorporating genetically sensitive designs (i.e. discordant MZ design) along with longitudinal prospective data, researchers may gain a better understanding of temporal priority and begin to draw inferences of causality. This is because the genetic background is the same within a MZ twin pair, therefore this research design rules out the possibility that genetically influenced differences evoke different environmental exposure (Vitaro, Brendgen, & Arseneault, 2009). Nevertheless, it does not rule out the possibility that there may be other correlated unique environmental factors which may account for the association between an observed unique environment and behavioural developmental outcome. For example, when investigating the unique environmental experience of having a mother who has difficulty coherently structuring her thinking, other correlated unique environmental factors such as having a positive and strong relationship with another caregiver may also be a contributor. It is thus important to account for any potential correlated factors when employing the discordant MZ twin design.

7.7 Conclusions

Overall, this thesis demonstrated the process of developing and validating a new set of maternal scales. This new coding scheme was designed to quickly summarise the way mothers formulate and structure their descriptions of their children, gathering an array of information not captured by pre-existing coding procedures. Results indicate that the structural features summarized by the two new scales, Descriptive Reasoning and Relevance, are associated with mothers' personality features, after controlling for parenting measures, and prove useful when trying to predict children's externalising and internalising behaviour, even after taking into account socio-demographic factors, parenting measures and children's early histories of behavioural problems.

Maternal scales' ratings are also helpful when trying to predict children's cognitive development, even after accounting for their previous IQ and prosocial behaviour scores. The new maternal scales thus further our understanding of maternal narratives and the use which can be made of the information collected from mothers in relation to their children.

Annex 1: Coding Sheet

Family ID _____

Interviewer _____

Elder Twin

(1) Coherence	0	1	2	3
(2) Relevance	0	1	2	3
(3) Reflectiveness and empathy	0	1	2	3
(4) Agreeableness and openness	0	1	2	3
(5) Number of prompts		_____		
(6) Timing of the first prompt		_____		
(7) Number of digression		_____		

Younger Twin

(1) Coherence	0	1	2	3
(2) Relevance	0	1	2	3
(3) Reflectiveness and empathy	0	1	2	3
(4) Agreeableness and openness	0	1	2	3
(5) Number of prompts		_____		
(6) Timing of the first prompt		_____		
(7) Number of digression		_____		

Annex 2: Sample transcripts of maternal FMSS interviews at age 10

Interview 1

Interviewer: Hi there, I am interviewing family ID xxxx. I am interviewing mum about her elder twin M and M's ID is xxxxx. So, whenever you're ready, tell us a little bit about what she's like.
Mum: Uhm..... Uhm.... She's grown up now than she used to be. She's changed in the way she used to be like. She's been moody and everything… So she has grown up quite a lot. Uhm, I don't know what to say,,, She's good, she's just changed since…She's been taking herself to school. Her education's good. She's higher than the others. So yeah, and I am happy with her… so yeah, she has changed. Yeah, I don't know what else…

Interviewer: How do you think she is developing for a child of her age?
Mum: Yeah, good, yeah. She's like advanced. She in a..... She's advanced

Interviewer: You think she might be growing up a bit too fast?
Mum: No, no, just about right, about right. She's alright.
I don't know what else you want. I don't know what else you want to know.

Interviewer: You're doing really well. Just keep on telling us a little bit more about her.
Mum: Uhm… I don't know, I am just happy with her really.
She's alright, she's good. She's just changed. There's nothing.
Yeah, she's alright.

Interviewer: In what way would you like her to be different?
Mum: Uhm… different…. Uhm, sometimes she has like attitudes, sometimes, so just when I tell her something and she has moods, but, yeah, in that way, bad moods and that's it really. The way she speaks to you sometimes, otherwise, it's not all the time, but yeah. Just the way she speaks to you. Don't know what else….don't know what else…

Interviewer: How do you feel about M starting secondary school?
Mum: I was a bit.. the last one…No, the next one, secondary school going up to high school the one that she's gonna go next.. the last one… I am a bit worried about that, but I think it should be okay just the way she is in school.

Interviewer: Yeah
Mum: Yeah, I think she'd be alright. I am a bit worried yeah.

Interviewer: What are you worried about?
Mum: Uhm… Just…. I think she'd cope, it is just like….. The school she might go to it is real difficult
(Phone rings) Real difficult things going on…. Put it back down, put it back down. Up! Up! God Sophie's…
No I think she will be alright. But when you hear different stories about different schools and…
No I think she will do alright.

Interviewer: And how would you describe her personality or her temperament?
Mum: What, like her mood swings? No… Uhm Yeah, she's… I was just happy she could change the way she speaks to you. But it's not all the time. That's what I mean, she has changed a lot. She has grown up now. I used to have a lot of trouble with her when she was younger. She has changed. Yeah, no, I'm happy she's okay.

Interviewer: And how would you describe her personality or her temperament say compared to her sister?
Mum: Uhm, uhm I've got no I've got no she is different from her sister Uhm yeah she's… no… I ain't got really no. She's alright in that way. She's okay. I got no worries about that. She's okay. she is totally from, totally different from J yeah. Totally different…Yeah… Otherwise alright.

Interviewer: And how do you feel about M when you take her out to visit relatives or to go out shopping? How do you feel about taking her out?
Mum: Yeah alright yeah, she's good she behaves so yeah, its alright, as long as I separate them. So she's alright

Interviewer: Is there anything else you would like to tell us about her?
Mum: Uhm, don't know. No I am quite happy with her now I had a bad time with her when she was earlier, but she has changed so yeah I'm alright. It was quite hard when she was a bit younger a lot of trouble with her no she's alright now I am a bit glad she has changed in a way. Had a bad time with her

Interviewer: Thank you so much

Maternal ratings:
Descriptive Reasoning: Score of 0 out of a maximum of 9
Relevance: Score of 0 out of a maximum of 3

Interview 2

Interviewer: I am interviewing family ID xxxx. I'm interviewing mum about her younger twin J and J's ID is xxxxx. Just tell us a little bit about her.

Mum: Oh dear. She has changed. She has like… stepped back a bit. She's been like babyish. So, I don't know what. She's just, she's changed and uhm… She's…We'll tell her to do things and she's just like taking a notice and the school has picked up on it as well that she is not listening and it just goes in one ear and then out of the other. The school's phoned me about that as well. Yeah, she has dropped down a bit. I don't' know what…Otherwise I think she's fine. I do worry about her at school cause I think she might be a bit behind at school. I need to go back and find out again. Yeah, I am a bit worried about her. That is why it is a bit difficult now… now but since for J. So yeah it is hard. Yeah...

Interviewer: So do you think she is developing a bit too slow?
Mum: Uhm yeah cause she's dropped down a bit, she could… Yeah she has… She could be up a bit more. I don't know why. I don't know how she got like that. She just changed. So yeah I need to find out with the school again, really. Yeah, a bit slow… She needs speeding up a bit. That's why I am a bit worried she goes to the other school, you know? And she wants to go to a different school, you know, not the same school.

Interviewer: And how do you feel about that?
Mum: Yeah she's happy I mean she's motivated from friends about the school. She wants to go to Saint Paul's and it's like a Catholic one, but you don't have to be, you just tell them you are, or something like that, that is what I've heard. It's uniform, so yeah I don't mind. Must go have a look and see what's it's like. And it seems it's more strict there as well. That might help her a bit more. It might. I mean she's only got another year. So yeah… They are going to another class in September, so yeah she needs to learn quite a lot from now, another class, another year. Yeah, they need to like… Cause like I am busy as well so it's a bit hard to phone them up, the school, the time I get home, find out about what's happening with her, until parents evening. I need to find out more about her to make sure she's alright. Cause they're doing tests now, so will find out if she's alright. You got me thinking.... I should do.

Interviewer: How do you think she will cope with the change to the big school?
Mum: Uhm, I don't know, I really don't know with J. You know I think she might be alright but like now, she comes home and tells she's done this and that and she likes art, so I really want to push her into doing that. Cause she's dropped down, I don't know she might I don't know what its gonna be like for her.I think she needs to stay out of school a bit longer, but then you know I don't know, I need to find out. I need to find out now. I don't know how she is gonna cope.

Interviewer: In what ways would you like her to be different?
Mum: Uhm, she needs to, don't know, I think she needs to grow up. She needs to grow up. I don't know, to be dif….. no… I want her to grow up a bit more, like her age. She's like babyish. It's hard.

Interviewer: And how would you describe her personality, her temperament?

Mum: Uhm…Yeah, see, that's what I mean, she's like… She's totally different from M. That's what I mean, she's like gone back to being babyish. I just, I don't know.

Interviewer: In what ways? Tell us a little more about that.
Mum: Uhm…She gets upset easy, see I don't know if she's… if it's seeing me. I don't take it out on them, you know, I don't hurt them or nothing like that. Maybe I shout at them and she gets upset. So you know, she gets upset quite easily and or she storms upstairs and slams the door. Yeah she's… she gets upset so I am a bit worried. It's a bit hard for J at the moment.

Interviewer: Is there anything else about J that you want to tell us?
Mum: No, she's… She's quiet when she is out with my sister. Apparently she's quiet on her own. Uhm, oh well she's, she's a nice girl. She likes animals and cats. So she's… and M she likes all animals and all that. And they do get on sometimes. Yeah. And they have grown up since….. you know M has. It's just J. I don't know. I wish J would hurry up and… cause I don't want her to be behind. I think she's behind in reading, I think. I need to find out. I need them to stay on. I need them to stay in school. So yeah I need to find out.

Interviewer: Sure. Thank you so much.

Maternal ratings:
Descriptive Reasoning: Score of 0 out of a maximum of 9
Relevance: Score of 0 out of a maximum of 3

Interview 3

Interviewer: I am interviewing family ID xxxx. This is mum talking about her elder twin D and D's ID is xxxxx.

Mum: D can be a very loving, caring child, loves to share, a little bit unfriendly uhm if she does not know you. Uhm…Very good on the street, very good in all given classes. Uhm, loves to fight with her sister in the house and very good reports every year from school (very long pause). A bit on the lazy side when it comes to helping, tidying up her bedroom. In all it is a pretty good 10 year old (pause).

Interviewer: Do you think she is developing the way she should for her age?
Mum: Uhm, yes I think she is developing okay. Uhm…In clothes size, in shoe size, yeah fine. In a young girl's
position, yes. Uhm… Sometimes I wonder if she's developing a little bit too fast, but in all the developing is fine.

Interviewer: In what ways would you like her to be different?
Mum: Well, I don't think I'd like to change her. Uhm…I wish things like to do more in the house. In all, she's a pretty good girl. In every child there's good and bad. But when she does have a bad turn, she has a bad turn. Uhm, only really to get on with her sister a little bit more and in the house really I'd say I'd like to change. But then that's all sisters, brothers, all of them fight at the end of the day, so...

Interviewer: How do you feel about her starting high school?
Mum: Uhm, I think like all mother, scared cause their children has left the little schools and going to the big school. Different company…Uhm…Being on the street on their own a bit more cause they're getting big. And being young girls as well cause in this day and age no-one seems to be safe anywhere. But regarding them to be going to big school, I just hope that they get on, do their work and come home.

Interviewer: And you think De will cope when she starts high school?
Mum Yes I do think she'll cope, but I think it will take her a lot longer to settle in than her little sister, because it took her a while to settle in her primary school. Every morning we had tears for over a year. Nursery, then she went up to reception class. And it's like every holiday she got use to being back at home. So she had a job to settle back in. But all in all she's been pretty good. She's not too bad. I'd like to hope she can settle in one school and get on and not move around to find her identity.

Interviewer: How would you describe D's personality, temperament say compared to other children the same age as her, kids she is as school with or..?
Mum: I think her temperament can be… really mixed when it's her sister, but regarding her temperament with other people and other children, she has a very good sense of humor. She gets on well with children and grown-ups. Uhm… A little bit on the soft side because she was bullied for 3 years in school uhm…and it was not sorted until this year in actual fact. Uhm…this September when they went back. Uhm, I don't know whether that was because she's the weaker

one out the twins but all her school life they were in separate classes, but this last year they're in the same class and all the bullying seem to have stopped all of a sudden, and all the picking on since have stopped. In all for what that I thought she'd been through, I feel that she's got a pretty good sense of humour.

Interviewer: Any other things……
Mum: Fun loving child.

Interviewer: When you go out with her in public, say you're on the bus or in the supermarket, how do you feel about her, when you're out with her?
Mum: With her I am fine she's as good as gold when we're on the street. She's just as good as gold when we're in people's houses. As I say, she can be as good as gold indoors as well, but sometimes her and her sister don't hit it off and they're just fighting and arguing.

Interviewer: Any other things you would like to discuss before we stop the tape.
Mum: No, she's just a fun loving child. Very gentle. Plus her attitude I think for a 10 year old is pretty reasonable. Uhm…I just hope she keeps it up really. I don't really have anything to say about her. I can't think of nothing right now. I think that is it.

Interviewer: Okay, thanks for that.

Maternal ratings:
Descriptive Reasoning: Score of 3 out of a maximum of 9
Relevance: Score of 2 out of a maximum of 3

Interview 4

Interviewer: I'm interviewing family number xxxx and this is mum talking about the younger twin T.

Mum: Uhm T is a very outgoing, loving child. Uhm… More friendlier than her bigger sister.Uhm… Makes friends easy. Gets on with people. Uhm… No problems in school. Uhm… developing very fast. A little bit Mrs. Know It All. A bit quick tempered and flies off the handle…

Interviewer: Would you ever say she's growing up too fast or too slow?
Mum: I think she's growing up a little bit fast for a 10 year old. Uhm…She's developing rather fast for a little girl. Uhm…I think she's a little bit more streetwise than her big sister. Uhm…Cant' think.

Interviewer: In what way would you like her to be different?
Mum: I'd like her hot temper to calm down a little bit better, a bit more and not think that everything she says and does is right. I'd like her to sit and listen a little bit more to learn. Uhm…I wish she would not snap at her little sister, her big sister like she does sometimes.

Interviewer: Anything else?
Mum: Can't think.

Interviewer: Then she will be starting high school soon. How do you feel about her starting?
Mum: I am a little bit more concerned over her because she's more easy to mix with people, so if someone's going on the wrong road she's more likely to follow them than her bigger sister. Uhm…She's happy-go-lucky child, uhm, but I think sometimes she can be overfriendly. And that could cause danger.

Interviewer: You think she'll cope with school?
Mum: I think she'll cope very well in school. She has all through her school life. She's coped, she always has done well. Every year a good report. Uhm…But I'm just worried a little bit about her overfriendliness for when she starts big school and mixing with older children in the school making friends, mixing with older children and they lead her astray a little bit. As I said she is very, very friendly.

Interviewer: So again if you think of her compared to her peer group, her friends, how would you describe her personality, her temperament?
Mum: To friends and outsiders, you would not think butter will melt in her mouth. She's a lovely child, but like all brothers and sisters, she fights with her big sister, tries to bully her a little bit. In all, she has got a fantastic personality apart from around the home.

Interviewer: When you're out with her again, when you take her to the market, or you're on the bus, or on the street with her, how do you feel going out in public with her?
Mum: T is a good child on the street. She's a good child in any public places we go. She doesn't embarrass me, she doesn't show me up. I think they just wait for themselves to get home, and then they'll start on one another. In all, she's a good child. I haven't got no embarrassment situation with her or one of those children that cry for everything, she's nothing like that. She's nothing like that.

Interviewer: Any more ways you'd describe her?
Mum: Apart from she's friendly, very loving. I'd like to see her get on with her sister a little better, but like all brothers and sisters, they all fight. Uhm…That's about it really.

Interviewer: Ok. Thanks for that.

Maternal ratings:
Descriptive Reasoning: Score of 3 out of a maximum of 9
Relevance: Score of 2 out of a maximum of 3

Interview 5

Interviewer: I am interviewing family ID xxxx. I am interviewing mum about her elder twin Z and Z's ID is xxxxx.

Mum: Okay, Zack is quite a serious little boy. He's probably more serious than his brother and very questioning. He asks questions all the time. At school he is very academic and he... he... he enjoys all his subjects, particularly, he is really good at maths and uhm, yeah really good at numbers, very good in sport, in fact, probably top in everything in his class. He's just a complete nightmare (giggles). And he's just got a constant thirst for knowledge. Uhm, he won't ever take what you said at face value. He will ask you about it and get you to talk about it in great detail. Uhm, he gets on well with a lot of people. He's a very social little boy, has lots of friends. Uhm, what else can I say about Zack? He's very timely. He would get up extremely early in the morning, get all his stuff ready. He has to be, everything's meticulous. He's very organised. Everything has to be laid out in a certain way. If it's not in the order that he wants it in, he goes mad about it. Uhm and the same with his food, he's very fussy about what he eats. Everything has to be healthy. If it's not healthy, he won't eat it. He won't even go to MacDonald's anymore. It's getting rather bizarre. He loves his fruits, he loves his veg and he likes proper dinners. He won't eat junk food. Although he does like a bit of chocolate like we all do. Uhm, he, uhm, bless him, he's the only one that wears his glasses and he's got half a brace, but he's quite okay about that really. He has to have his hair worn in a certain way. He has to gel it up every hair has to be in the right place. If he wears clothes they've got to be in a certain way. They've got to be, he drives me completely mad actually (giggles), they've got to be ironed in the right way. I mean he's only ten. What hope is there for anybody else really? (giggles) And I'm his mother. Uhm, yeah he's just completely organised about everything, but he's very loving. And, uhm, yeah, he will be the one to ask the question you don't want him to ask. You know, he'll notice things that probably nobody else will notice. He'd be watching a film and he'll pick out the bit that you think "I hope he did not notice that", but no, no, he would have seen it and he would ask you about it. He is absolutely convinced he's going through puberty, which is quite hilarious, cause he thinks he's got one hair under his arm but I can't see it. But no it's there according to Z, and if it's there, it's there. Even his bed sheets have to be in the right way. He'll make his bed every morning. And if things aren't in the right order, if you put something down on the table, he'll tidy up and put it round the right way. He's like it at school. He drives the teachers mad. He'll go and tidy their desk for them. And if they want anything done, they will ask him "Z, can you tidy my pencil drawer?" and he'll go and do it and it will be completely amazing, because he, that's what he's like. What can I say?

Interviewer: Uhm, in which way would you like him to be different?

Mum: I don't really, I don't want him to be different. He is how he is and uhm we're all different, so you know, I just accept him for the way he is. Don't want him to be any different and you know, I don't force him to be something he is not. If he's gonna be that way, then he's gonna that way and that's it really. We are who we are at the end of the day.

Interviewer: How well do you think he's developing for a child of his age?

Mum: I think he's developing really well. I think he's got a knowledge and a sense which is far above his years really which I can't remember ever being like that at his age. I think a lot of children are suppose to be a lot more these days very early and I think it makes them, we didn't have the internet, I mean we even hardly watched telly. They don't watch that much telly but they're very thirst for knowledge I would say. They're very aware, much more aware than I ever was, you know, when I was that age.

Interviewer: Yeah, how do you feel about Z starting secondary school?

Mum: I think he's more than ready for it. In fact, I think he's ready for it now. He tells me that he's bored at school and then I've told his teacher and she said "What? Right, I'm gonna give him some more hard work." And she's actually sort of given him work that is over and above the year that their doing now, because he's just hungry for knowledge all the time. It's quite difficult at times because he's just a little boy that wants to know more.

Interviewer: That's great. Thank you very much.

Maternal ratings:
Descriptive Reasoning: Score of 9 out of a maximum of 9
Relevance: Score of 3 out of a maximum of 3

Interview 6

Interviewer: I am interviewing family ID xxxx. I am interviewing mum about her younger twin J and J's ID is xxxxx.

Mum: Okay, what can I tell you about J. He is a very happy, jovial child. He is very clever, but sometimes he lacks concentration. He, yeah, has a very sort of low attention span really, will jump from one thing to the other very quickly. He is really, really, popular. He's got loads and loads of friends. He is more social than anything. He's very loving. He's very giving. He would give anybody his last sweet rather than keep it to himself. He's really helpful with other children. He helps younger kids. He helps anybody that's less able than him. Uhm, he's a kind little boy. He'd always help me round the house. He does things for me a lot. He will always get the shopping in from the boot. He would help me put it away. He will re-arrange the fridge for me. He's not the tidiest of children. He will leave papers and stuff everywhere, but his hearts in the right place. And with his little brother, he will look after him and protect him more than Z would. And they fight like anything, I have to say, him and H. I don't know why, but they do. But H always goes to J for everything and J is sort of like a mini dad at times. And if there's anything wrong, he would always sort him out. That's just the way he is. He is very fashion conscious and music conscious and everything. You know, he will just want the latest CD's and latest clothes and the latest trainers and the look is just so important. And he always worries about what he looks like and he's quite funny like that and he has lots of friends. [*Says to her younger twin: Go away a minute hey, you're not supposed to be listening*] And he eats a lot of sweets as suppose to his brother, he doesn't. J would rather just eat rubbish. He's very fussy about food. He doesn't eat a lot of anything that is good for him. I will try and make him he'll say "I don't like it" every time "cause it's horrible". At school I know he's very very capable but he chats a lot and gets easily distracted. He's quite scruffy and disorganized really. I mean, he gets up in the morning late. Uhm he will leap into his clothes at the last minute, you know and, despite the fact that he is quite fashion conscious and the rest of it, he doesn't really care what he looks like going to school. And he'll just absolute, sometimes he will look an absolute state when he goes out. I go mad and he's like "What's wrong?" And he'll forget to do his hair or he'll forget to clean his teeth if I don't tell him. "Have you cleaned your teeth?" "Oh no, I forgot." That's just J. That's what he's like really.

Interviewer: How do you think J's developing for a child of his age?

Mum: Yeah, I do. I think they are developing in completely different ways, but yeah he's developing fine for his age, yeah.

Interviewer: In what ways would you like him to be different?

Mum: I don't want him to be different. Again he's just Jake, and, you know, however they turn out is fine by me. It really doesn't matter. You know, I think they've got very good social skills, but that's probably from the way I bring them up. I taught them about all sorts of things including diversity and how people are different and to be accepting of people, and you know, they don't laugh at disability or things like that because they don't because I've not brought them up like that. I brought them up to accept, you know, people are different. We all got different colour skin, unique in the way that we are and that's how they are. They don't have any particular prejudices

that I've noticed anyway. I mean everybody does, but you know. They're just who they are and I'll be happy however they turn out really.

Interviewer: How do you feel about J starting secondary school?

Mum: Again I think he is more than ready to start. Fine, I mean, I know they're very sensible, they're very level-headed. I feel fine about him starting. I think it'll do him good. And they gonna have to get the bus on their own as well which will be a next step for them, but they'll be please, cause they'll be able to have a mobile phone then.

Interviewer: How well do you think J will cope?

Mum: With going to secondary school? Oh, I think he'll be fine. I don't have any worries really. They're just ready for it. They're ready for the next stage in their development which will come next year.

Interviewer: Alright, thank you very much for that.

Mum: Okay.

Maternal ratings:
Descriptive Reasoning: Score of 9 out of a maximum of 9
Relevance: Score of 3 out of a maximum of 3

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